ENVIRONMENTAL ASSESSMENT

for the

# West Fork Illinois River Landscape Management Project

EA #OR117-04-07

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT
GRANTS PASS RESOURCE AREA

June 2004

Dear Reader:

We appreciate your interest in the BLM's public land management activities. We also appreciate your taking the time to review this Environmental Analysis (EA). If you would like to provide us with written comments regarding this project or EA, please send them to me at 3040 Biddle Road, Medford, OR 97504.

I know that people sometimes would like to make comments but would prefer to do so confidentially. Please be aware that comments, including names and addresses of respondents will be available for public review or may be held in a file available for public inspection and review unless you specifically request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this clearly at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or officials of organizations or businesses will be made available for public inspection in their entirety.

Abbie Jossie
Field Manager
Grants Pass Resource Area

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

EA COVER SHEET

RESOURCE AREA: *Grants Pass* FY & EA: OR117-04-07
ACTION/TITLE: *West Fork Illinois River Landscape Management Project*
LOCATION: T40S-R8W-Sec 9, 20, 21,27, 28, 32, 33
T41S-R9W-Sec 2, 3, 9, 10, 12, 13, 14, 15, Willamette Meridian

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ENVIRONMENTAL ANALYSIS
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## 1.0 Introduction

The purpose of this Environmental Assessment (EA) is to assist in the decision making process by assessing the potential environmental and human affects resulting from implementing the proposed project and/or alternatives. This EA will also assist in determining if an environmental impact statement (EIS) needs to be prepared or if a finding of no significant impact (FONSI) beyond those considered in their related EISs is appropriate.

This EA tiers to the following documents:

(1) the Final EIS and Record of Decision dated June 1995 for the Medford District Resource Management Plan dated October 1994 (RMP-ROD);
(2) the Final Supplemental EIS on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl dated February 1994;
(3) the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and its attachment A entitled the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl dated April 13, 1994 (NFP-ROD); the Northwest Forest Plan;
(4) the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (January 2001);
(5) the March 2004 Record of Decision and the January 2004 Final Supplemental EIS To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines;
(6) the March 2004 Record of Decision Amending Resource Management Plans for Seven Bureau of Land Management Districts and Land and Resource Management Plans for Nineteen National Forests Within the Range of the Northern Spotted Owl, and its Final Supplemental EIS for the Clarification of Language in the 1994 Record of Decision for the Northwest Forest Plan amending wording about the aquatic conservation strategy.
(7) the Final Supplemental Environmental Impact Statement for the Management of Port-Orford-Cedar in Southwest Oregon (December 2003) and its May 2004 Record of Decision (POC-FSEIS/ROD).

Planning and biological surveys for the West Fork Illinois River Landscape Management Project began prior to the March 2004 ROD which changed the Survey and Manage program. The ROD (p. 8) does allow such a project to be completed under the S&M standards and guidelines. The West Fork project is designed in accordance with these standards and guides and these species will be managed as survey and manage species throughout this project.

The planning of the West Fork Illinois River Landscape Management Project also drew from the ideas, information and recommendations of the following documents:

(1) West Fork of the Illinois Watershed Analyses (USFS, 2002);
(2) West Fork of the Illinois Watershed Analyses (BLM, 2003)
(3) Rogue River/South Coast Biological Assessment / Biological Opinion (1-14-03-F-511 October 2003)
(4) 2003 Survey and Manage Annual Species Review (USFS Memorandum November 20, 2001, file code 1900/2620; and BLM Information Bulletin No. OR-2002-033)

Terminology used in this EA follow the definitions of the RMP.

## 1.1. Purpose of and Need for the Proposal

The broad purpose of the proposed action is to implement the Medford District's Resource Management Plan (RMP). The West Fork Illinois Landscape Management Project is designed to meet a variety of resource and human (social/economic) needs and objectives outlined in the RMP and the Northwest Forest Plan. These include the following:

- contribution to the Medford District's timber harvest and forest products commitment, thus helping meet the demand for wood products both regionally and nationally and supporting local and regional economies

- management of the public land in a manner that will provide for and promote a wide variety of non-commodity outputs and conditions including wildlife habitats, botanical habitats, historic fuel levels, riparian structure and function, sustainable forest conditions, recreation opportunities, maintenance or improvement of water quality, and fisheries

## 1.2. Project Location

The general location of the West Fork Illinois Landscape Management Project is shown on Map 1: Project Location Map (All Maps are located in Appendix A). The project area is located within the West Fork of the Illinois River watershed.

## 1.3. Planning Issues for the Project

A variety of issues and concerns were raised during the initial scoping of this project. These were raised during project scoping by the public comments, the BLM's interdisciplinary project planning team. For the purposes of this EA an "issue" is defined as an element or concern that is unique to the project area and that may need to be given particular, out of the ordinary, consideration in project planning.

The main planning issues identified as pertinent to the project are listed below. Many of these issues were used in the design of the proposed project and alternatives. In some cases, an issue raised was considered at the onset by the planning team and then eliminated from further consideration because it was judged to be outside the scope of the project or proposed action(s). The primary issues identified for this project are as follows:

(1) Terrestrial habitats and forest stand conditions- Forest, meadow, and savannah conditions have been influenced by fire exclusion, mining, human habitation, and logging. The current condition is generally characterized by excessively overstocked stands, high fuel loadings and a higher percent occupancy of shade tolerant and fire intolerant species than were present historically. Fire exclusion has resulted in meadows and savannah habitats being encroached upon by a variety of tree and shrub species.

(2) Aquatic resources and riparian reserves - Coho salmon (ESA threatened) and critical habitat are present in the planning area. Many riparian reserves are characterized by

deficiencies in terrestrial and aquatic large woody material, excessively overstocked stands, reduced complexity of in-stream habitat and high fuel accumulations which present an increased risk of a stand destroying event. The watershed contains streams listed on the 1998 DEQ 303(d) list as water quality limited due to flow modification or excessive summer water temperatures. Some aquatic habitats have been impacted due to roads which have modified the channel morphology and altered the quantity and quality of surface water flows.

(3) Wildland/Urban Interface Area Management/ Social Issues/ "Quality of Life"- The project area includes areas where BLM lands are intermingled with rural residential lands. The following are some of the concerns expressed by rural residences: the maintenance of landscape visual quality, the effects of forest management on domestic water quality/availability, the associated risks in the use of prescribed fire as a management tool.

(4) Fire risks and hazards are high in the watershed because of fire exclusion, lack of active forest management, species shift from shade intolerant/fire tolerant to shade tolerant/fire intolerant with increasing stand densities. The issue is especially critical in the rural interface with the danger of a wild fire moving from private property to BLM land or vice versa.

(5) Cultural Resources- The project area contains numerous historical / archeological sites. They include the earliest evidence of placer mining in Josephine County and Southwest Oregon. The hydraulic mining sites and mining ditches date back to the 1850's. Many of these sites are still evident and visible within the project area. The sites create a historical record of the technological advances made in gold mining from the mid-1800 through the 1930's.

(6) Unique habitats- The project area encompasses unique plant communities that include Jeffrey pine savannas, *Darlingtonia* fens, and Western white pine associated stands. Many rare plants are found on serpentine habitats, and some species are only found on serpentine substrates. It is believed that these plant communities evolved with repeated natural fires, and may be now at risk due to fire exclusion during recent history.

(7) Port-Orford-Cedar (POC) grows within some riparian areas in the watershed. The species is subject to a root disease *Phytophthora lateralis* (PL). Potential spread of PL to other un-infested watersheds by human vectors (i.e. logging equipment, OHV use) and mortality to riparian POCs are concerns within the project area.

## 1.4. Land Use Allocation Objectives

The project area is located within matrix and riparian reserve land allocations. Land Allocations are set forth in the NFP and RMP-ROD (p.36-37). The reader is referred to these documents for discussion of the broader objectives specific to each of the land allocations

# 2.0 Proposed Action and Alternatives

This chapter describes the proposed action and alternatives that are addressed and analyzed in this EA.

## 2.1. Alternative 1: The No Action Alternative

In this EA document, the "no-action" alternative is defined as not implementing any aspect of the action alternatives. Defined this way, the no action alternative also serves as a baseline or reference point for evaluating the environmental effects of the action alternatives. Inclusion of this alternative is done without regard to the decision made in the Medford District RMP.

The no action alternative is not a "static" alternative. Implicit in it is a continuation of the environmental conditions and trends that currently exist or are occurring in the project area. This would include trends such as vegetation succession and consequent terrestrial and aquatic habitat changes, increases in fire hazard, road condition/deterioration, normal BLM scheduled road maintenance, rates of erosion, current road densities, various unregulated uses (i.e. OHV use, equestrian use, wood theft, illegal dumping) etc..

## 2.2. Alternatives 2 and 3: Action Alternatives

### 2.2.1. Introduction

Two action alternatives are proposed and analyzed (see Table B-1 in Appendix B):

- Alternative 2 is the most encompassing alternative. It proposes treatment on approximately 2,759 acres and includes treatments in riparian reserves.
- Alternative 3 proposes treatments in approximately 1,242 acres. It does not propose treatments in riparian reserves; it excludes units that do not currently have BLM road access necessary to support vegetation (silvicultural or fuels) treatments; and it excludes units where vegetation treatments are judged not to be currently warranted (*e.g.*, stand conditions don't require intensive or immediate treatment for forest health or hazard reduction over the next 5 years, stands where effective vegetation treatment would be so costly that the current successional trend is left to take place (*e.g.*, high density tanoak stands), or which may be judged to be less in need of forest health or wildlife restoration treatments based on an assessment of forest health conditions and fire condition classes.

Within each action alternative described below, aspects of the proposed action are organized and presented based on broad "types of action" (*e.g.*, road actions, riparian restoration treatments, fisheries enhancement, vegetation and fuel treatments, recreation related proposals, etc).

In designing the two action alternatives, other options or alternatives were considered during the planning phase of this project. Generally, these other options or alternatives were resolved during planning and as the final proposals emerged. Those carried forward in the two action alternatives are described in this section.

The project design features described in Chapter 2 are also an integral part of all of the action alternatives.

Table 2-1 compares the alternatives. A more in-depth discussion of the alternatives and their resource

objectives and proposals follows.

**Table 2-1: Summary Comparison of the Proposed Alternatives**

| Treatment Categories | Alternative 1 | Alternative 2 | Alternative 3 |
|---|---|---|---|
| *Older Seral Stand Treatments on matrix lands* | *No treatments* | *High and lower priority commercial forest acres would be treated.* | *High priority commercial forest acres would be treatment. Reduced matrix acres. Some lower priority units would drop out.* |
| *Wildlife Habitat restoration of Jeffrey pine/white oak areas* | *No treatments* | *High and low priority sites would be treated to reduce fuel hazards and revitalize, maintain or enhance vegetation and habitats.* | *High priority sites would be treated; no low priority sites would be treated.* |
| *Riparian Reserves* | *No treatments* | *Riparian area (aquatic and terrestrial) restoration with potential thinning from below and subsequent tree removal once snags and down wood requirements are met. POC sanitation would occur where roads proposed for sanitation intersect riparian reserves. Riparian reserve treatments would involve improvement of stream crossings and in-stream habitat* | *No riparian reserve vegetation treatments, except where roads proposed for POC sanitation intersect riparian reserves. Riparian reserve treatments would only involve improvement of stream crossings and in-stream habitat.* |
| *Fuels and prescribed fire* | *No treatments.* | *Hazardous fuels and understory treated in high and low priority matrix harvest, young stand management, and wildlife restoration units. Slashbuster treatments proposed for selected units.* | *Hazardous fuels and understory treated in high priority units. No restoration fire treatments planned in proposed RNA. Slashbuster treatments proposed for selected units* |
| *Young Stand Management* | *No treatments* | *Young stand management units would be treated and their included riparian reserves* | *Young stand management units would be treated, excluding riparian reserves* |
| *Roads* | *No change to current road maintenance schedule.* | *Maintain and improve existing roads to current standards. Construct approx 1 mile of road.* | *Maintain and improve existing roads to current standards. Construct approx 1 mile of road.* |
| *Recommend 631 acres in 41-9-9 for RNA status* | *No* | *Yes* | *Yes* |

**Table 2-2: Summary of the Key Differences Between Action Alternatives**

| PROPOSED TREATMENT | *Alternative 2* | | *Alternative 3* | |
|---|---|---|---|---|
| | Acres | Est. Volume (mmbf) | Acres | Est. Volume (mmbf) |
| Matrix harvest | 569 | 4.250 | 442 | 3.332 |
| Riparian Reserve treatments | 115 | 0.452 | 0 | 0 |
| | Acres | | Acres | |
| Fuel Hazard Reduction (matrix lands) | 271 | | 108 | |
| Fuel Hazard Reduction (riparian reserves) | 94 | | 0 | |
| Wildlife Habitat Restoration and Enhancement (matrix lands) | 1,267 | | 598 | |
| Wildlife Habitat Restoration and Enhancement (riparian reserves) | 355 | | 0 | |
| Wildlife Habitat Restoration and Enhancement (within proposed RNA) | 631 | | 0 | |
| Young Stand Management (matrix lands) | 94 | | 94 | |
| Young Stand Management (riparian reserve) | 12 | | 0 | |

*Total BLM Acres within Project Planning Area = 2,875

The proposed actions are presented based on different types of management activities / themes: recreation, cultural resources, proposed ACEC/RNA, riparian reserve treatments, forest stand treatments for stand health and commodity production, fire hazard reduction, wildlife habitat enhancement, and roads and transportation.

### 2.2.2. Potential Research Natural Area (RNA) and ACEC

Designation of an RNA or ACEC on BLM lands is a resource management plan level land allocation. It is not a designation that is done at the project planning level. If a nomination and subsequent

assessment indicates that an area has high potential as an RNA or ACEC, final determination regarding its designation would take place during the next RMP planning effort. In the interim, activities would be limited so as not to compromise the specific values of the area until they can be fully reviewed in the future as a part of a future RMP planning effort.

#### 2.2.3.1 ACEC

During planning work in the adjacent East Fork Illinois River watershed, a nomination for a Waldo-Takilma Area of Critical Environmental Concern (ACEC) was submitted by several interested parties. The nominated area is located primarily in the East Fork of the Illinois watershed, but a portion of it is in the West Fork watershed. The proposal is currently being evaluated under a separate process.

#### 2.2.3.2 RNA

The objective of a Research Natural Area is to preserve, protect, or restore native species composition and ecological processes of biological communities (RMP p. 56). RNAs are available for short or long term scientific study, research, and education and will serve as a baseline against which human impacts on natural systems can be measured.

Within the project area, two plant associations which have the potential to fill vacant RNA cells as described in RMP. The potential RNA encompasses approximately 631 acres of T41S,R9W, Sec 9 (See Map 2). Numerous diverse serpentine habitats occur in this section, including grassland / savannah, forest/shrubfield, and California pitcher plant fens. In addition, the area contains two low elevation western white pine plant communities previously unmapped in Oregon.

The area contains both the east and west facing slopes of the West Fork Illinois River as it passes through the section. Elevations range from 2800' on the east ridge down to 1800' at river level. Whiskey Creek feeds into the West Fork in the northern part of the potential RNA, and springs are common, producing flow off the westside of the drainage.

The entire area is composed of serpentine soils. Due to varying moisture regimes, a diversity of serpentine habitats occur: grassland/savannah, shrubfields, western white pine or Jeffrey pine forests and California pitcher plant fens. POC occurs throughout the riparian corridor.

The plant associations in the forested/shrub areas are western white pine-Jeffrey pine/huckleberry oak/beargrass or western white pine-tanoak/huckleberry oak/beargrass. The plant association in the serpentine grasslands/savannah is Jeffrey pine/Idaho fescue. The plant association in the stream bank riparian areas is Port-Orford Cedar-Western White pine/huckleberry oak and is California pitcher plant//bog in the fens.

2) Alternative 2 (RNA)

Carry the area forward for full RMP based review of its RNA potential and possible designation. In the interim, two vegetation treatment alternatives are proposed.

a) Alternative 2A (RNA)

In addition to informal designation as an RNA, the proposal under this alternative would include

protection, restoration and enhancement treatments consistent with the values of an RNA. The primary focus would be to return fire to the area, the dominant ecological processes identified for this plant community type. POC sanitation would occur along road FS 4402.

A series of prescribed burns would be implemented in the next tens years in most of the RNA. Proportions of acreage, depending on vegetation types and aspect, will be left untreated in order to provide an area for baseline monitoring. Manual brushing may be needed in dense areas in order to insure a low intensity underburn. In these areas, brush will be manually cut and piled. Underburning would occur after these piles had been burned. Prior to any vegetative manipulation, a series of permanent monitoring plots will be installed representing the different vegetation types and aspects. Monitoring plots will also be used for monitoring for noxious weeds. The data collected on these plots will be used to formulate a site-specific burn plan that will focus on promoting native species. After implementation of this burn plan, the plots will be revisited and lessons learned will be integrated into the next prescribed burn plan.

b) Alternative 2B (RNA)

The RNA would be treated only per the wildlife habitat restoration / enhancement proposed action discussed below in Section 2.2.11. POC sanitation would occur along roads FS 4402 (see treatment description under the POC Section 2.2.6

3) Alternative 3 (RNA)

RNA designation would be pursued through the RMP process. If designated, a management plan would then be prepared. In the interim, no vegetation treatments would be conducted.

### 2.2.3. Riparian Reserves

Riparian reserves provide habitat and connectivity corridors for wildlife and fish. Riparian reserve widths are based on the interim widths of the NFP-ROD (p. C-30): 100’ slope distance or one site potential tree height on each side of intermittent non-fish bearing streams, whichever is greater, 150' or one site-potential tree height on each side of perennial non-fish-bearing streams, whichever is greater, and 300' or twice the height of a site-potential tree along fish-bearing streams, whichever is greater. Site potential tree height has been established in each plant series within the planning area. Within some of the riparian reserves, active management is proposed. Planned activities would be based on the existing stand / vegetation conditions at the local site, the potential for treatments to benefit the terrestrial and aquatic systems in both the short and/or long term, and their ability to meet and promote the ACS objectives. No-treatment zones are based on plant series/stream type. Incidental backing of prescribed fire would be permitted in the “no-treatment zones” but no active ignition would occur. Table 2-3 describes the no-treatment zones and planned activity.

a. Objectives

The objectives of treatments within the riparian reserves are to:

- Maintain late-seral conditions where they currently exist. In early, mid-seral, and mature stands that lack structural complexity, treatments would accelerate stand development into late-successional/mature structure (i.e., large trees, snags, down wood, species diversity and

hardwood retention).

- Reduce stand densities and fuel loads to reduce potential for stand replacement events.

- Decrease erosion potential by maintaining bank stability.

- Increase the potential for long term recruitment of large snags, coarse wood, and instream large wood, primarily in areas where vegetative treatments are proposed.

- Retain and improve effective shade on fish-bearing and perennial streams.

- Maintain or achieve 60% canopy closure in riparian reserves within the Douglas-fir and Tanoak plant communities within 10 years of treatment. Depending upon site characteristics the initial treatment may reduce overstory canopy to 50% in order to promote late-successional stand structure with vigorous crown response expected to raise canopy closure level to the 60% target (Berg et. al 1996).

- Restore stands to conditions consistent with natural fire regimes in Jeffrey pine, and white oak plant series. Retain overstory trees and riparian vegetation directly responsible for providing shade to the perennial streams.

- Maintain connectivity on a stand level for low-mobility species.

- Maintain roads to improve drainage and stream crossings to minimize sediment input

### b. Proposed Riparian Reserve Treatments

#### 1) Alternative 2

In order to meet the Riparian Reserve objectives stated above, a variety of vegetation treatments would be used. Treatments could include both high and low priority stands and all seral stages (See Table B-1). The treatment used in a particular Riparian Reserve unit would depend on the current stand conditions at the site. Understory treatments, precommercial thinning, brushing and fuels treatments, and commercial thinning will be implemented within the riparian reserves. Prescriptions within the riparian reserves will move stands toward late-successional conditions. Snags and woody material currently in stands would be maintained, and prescriptions would designate leave trees for future recruitment.

In the Jeffrey Pine and White Oak plant series, canopy closures, stand densities, and species composition would be reduced or manipulated through prescribed fire and mechanical means to more accurately reflect conditions that existed before fire exclusion (see Section 2.3.10 Wildlife Habitat Restoration and Enhancement for Jeffrey Pine and White Oak plant series treatments).

Vegetation would be cut and handpiled and burned, or broadcast burning would be used to reduce fuel loads and profiles (see Section 2.3.9 Fuel Hazard Reduction Treatments, and Table B-1 for proposed treatments).

The POC along Whiskey Creek and West Fork Illinois River in T41S, R9W Sec 9 is currently infected

with *Phytophthora lateralis* (PL). In order to restrict the spread of PL to uninfected areas, POC located within 50' of USFS road #4402 and associated roads (see Project Area Map) would be cut in roadside sanitation treatments. Research indicates host exclusion is the best method to eradicate the infestation once it has infected an area (Hansen and Hamm 1996). Where these roads cross through riparian reserves, the treatments would be implemented according to the proposed prescription (see Section 2.3.5 Port-Orford Cedar Treatments). Any material too large to handpile and burn (typically >6" diameter) would be left in the treatment area, including in and adjacent to stream channels. Underburning would be implemented as part of the treatment when consistent with the prescription. Planting of resistant POC would occur along BLM reaches of Whiskey Creek and West Fork Illinois and its tributaries.

Proposed road treatments such as maintenance on roads which cross riparian reserves would be implemented, as well as improvements of stream crossings (see Section 2.3.11 Roads and Transportation Management). In Section 9, two existing log culverts (now fords due to decay) will be replaced with corrugated metal pipes (CMP) on Road 41-9-9A where it crosses two unnamed tributaries to West Fork Illinois. In Sections 28 and 33, stream crossings will be improved by installing temporary and permanent culverts on non-fish bearing intermittent and perennial tributaries to Fry Gulch.

In Section 28, an existing ford crossing Fry Guck would be improved (armored by placing river run rock in the ford to create a running surface) and used when the stream is dry. An associated operator spur which cross the riparian reserve at this point would be reconstructed and barricaded following use.

#### 2) Alternative 3

POC roadside sanitation treatments would be implemented in riparian reserves as described above in Alternative 2, except that underburning would not be implemented. No other vegetation treatments would be implemented (See Table B-2). Prescribed burning not associated with POC roadside sanitation would not occur within the riparian reserves, though a backing fire could cross over into the riparian reserves at the outside edges. Proposed road treatments such as maintenance on roads which cross riparian reserves would be implemented, as well as improvements of stream crossings (see Section 2.3.11 Roads and Transportation Management). In Section 9, two existing log culverts (now fords due to decay) will be replaced with CMPs on Road 41-9-9A where it crosses two unnamed tributaries to West Fork Illinois. In Sections 28 and 33, stream crossings will be improved by installing temporary and permanent culverts on non-fish bearing intermittent and perennial tributaries to Fry Gulch.

In Section 28, an existing ford crossing Fry Guck would be improved (armored by placing river run rock in the ford to create a running surface) and used when the stream is dry. An associated operator spur which cross the riparian reserve at this point would be reconstructed and barricaded following use.

### 2.2.4. Stream and Riparian Habitat

Table 2-3 states these riparian reserve widths for this project by plant series, and the "no treatment" widths within the riparian reserves.

Silvicultural treatments in riparian reserves would maintain canopy coverage at 50+%. Vegetation primarily responsible for providing shade to the active channel would be retained.

Thinning, burning (with the exception of a backing burn) and brushing would not occur within a designated "no treatment" area immediately adjacent to each side of the stream bank. The width of these "no treatment" areas is shown in Table 2-3.

Handpiles within 25' of a stream channel or in the bottom of a dry draw would not be burned. Slash created adjacent to streams during vegetation treatments could be lopped and scattered instead of prescribed burning.

With the exception of Port-Orford-Cedar sanitation treatments in T41S,R9W, Sections 3 and 9 and where encroaching conifers will be cut within fens, a one site potential tree height no-cut riparian reserve would be maintained around springs and wet areas. This is to ensure shading (cooling) of available water and maintain soil stability at these sites.

**Table 2-3: Riparian Reserve Width and No Treatment Buffer Widths – Alternative 2**

| Plant Series | Stream Flow / Fish Presence | Riparian Reserve Width (ft)* | No-Treatment Buffer Width (ft)** | Riparian Reserve Treatments (outside no-treatment buffer) |
|---|---|---|---|---|
| Douglas-fir | Perennial, Fish or Intermittent, Fish | 330 | 50 | UT, UB, HP, CT |
| Douglas-fir (Logan Cut) | Perennial, Fish | 330 | 25 from edge of outer gorge | UT, UB, HP, CT |
| Douglas-fir | Perennial, no fish | 165 | 50 | UT, UB, HP, CT |
| Douglas-fir | Intermittent, no fish | 165 | 25 | UT, UB, HP, CT |
| Tanoak | Perennial, Fish or Intermittent, Fish | 360 | 50 | UT, UB, HP, CT |
| Tanoak | Perennial, no fish | 180 | 50 | UT, UB, HP, CT |
| Tanoak | Intermittent, no fish | 180 | 25 | UT, UB, HP, CT |
| Jeffrey Pine, White Oak | Perennial, Fish or Intermittent, Fish | 300 | 25 | UT, UB, HP |
| Jeffrey Pine, White Oak | Perennial, no fish | 150 | 25 | UT, UB, HP |
| Jeffrey Pine, White Oak | Intermittent, no fish | 150 | 0 | UT, UB, HP |

*Footnotes:*
UB = underburn/broadcast; CT = commercial thin; UT = understory treatment of trees <8"DBH ; HP = handpile and burn
* Riparian Reserve widths are calculated from Northwest Forest Plan definitions. The Riparian Reserve is the greater of two site-potential trees or 300' for fish-bearing streams, the greater of one site-potential tree or 150' for perennial, non-fish bearing streams, and the greater of one site-potential tree or 100' for intermittent, non-fish bearing streams. All distances are slope distance measured from the edge of the active stream channel and extend on each side of the stream.
**Within the no treatment buffer: No ignition will occur, no fire lines will be constructed. An occasional prescribed burn may back into the buffer zone. Exception could occur if needed to insure protection of private property.

### 2.2.5. Port-Orford-Cedar Treatments –Alternatives 2 & 3

#### a. Objective of POC Treatments

*Phytophthora lateralis* (PL) has been located along the West Fork Illinois River and Whiskey Creek, a tributary to the West Fork in T41S,R9W, Sec. 9. The objective of treatments is to reduce the occurrence of PL in those areas where it is known to occur, to reduce the potential of exporting the disease to un-infested sites, and to establish PL resistant POC trees in the project area.

#### b. Description of Proposed POC Treatments

POC sanitation treatments would be implemented along roads in T41S-R9W-Sec 3 & 9. In these areas, no live POC would be left within 50' of the road (toe of fill and the top of the road cut). During

sanitation operations POC boughs would be available for Special Forest Products collection. Cut material would be disposed of by handpiling and burning (Alt. 2 and 3) or underburns (Alt 2). This would follow the sanitation treatment. Burning has been shown to reduce the viability of PL in the soil (Ostrofsky et. al 1997).

A gate would be installed on Road 41-9-9 to restrict vehicle access thus to limit the potential spread of PL on vehicle tires. On this road, no POC sanitation treatment would be conducted.

In order to introduce *Phytophthora lateralis* resistance into the POC riparian plant community, resistant seedlings would be planted along BLM reaches of Whiskey Creek and West Fork Illinois and its tributaries. Since the infection is so widespread along these streams, eradication of all POC is neither possible nor proposed.

### 2.2.6. Special Forest Products (SFP) - Alternatives 2 & 3

#### a. Special Forest Product Objectives

The objective is to provide a range of special forest products for sale/collection including but not limited to poles and firewood.

#### b. Description of Special Forest Product Activities

All special forest product harvesting would be done in a manner that promotes attainment of the broader stand's silvicultural prescription and vegetation / fuels treatment objectives and pertinent project design features (Section 2.3 below). All timber harvest units (See Tables B-1 and B-2) would be available for SFP harvesting / collection. Materials resulting from activities associated with fuels reduction and young stand treatments that could be utilized would be made available for purchase. SFP harvesting would be contingent on access availability.

### 2.2.7. Young Stand Treatments / Forest Development – Alternatives 2 & 3

#### a. Objectives of the Young Stand Treatments

The objective of young stand treatment is to accelerate the growth of young stands, promote stand differentiation through species composition manipulation, maintenance of the non-tanoak hardwood component of the stand, and reduction of surplus vegetation, primarily brush species and tanoak.

#### b. Description of the Treatments for Young Stands

The locations of the proposed young stand treatments are outlined in Tables B-1 and B-2. The identified treatments are described as follows:

*(1) Brushing (BR)* - This treatment provides more growing space to enhance conifer and/or hardwood survival and growth. Surplus trees would be manually cut. Surplus hardwood vegetation is defined as all brush and hardwoods less than 8"DBH that are not selected as a leave tree. Conifer surplus trees are 6" DBH or less and not selected as leave trees. All tanoak less than 12" DBH would be treated as surplus vegetation. Conifer leave trees would be spaced approximately 8' on most units and hardwoods would be spaced at 25'.

*(2) Precommercial Thinning (PCT ) / Selective Slashing (SL)* - This work consists of cutting or girdling surplus trees and brush to increase moisture, growing space and nutrient availability for selected conifer and hardwood leave trees. All tanoak less than 12" DBH and most brush would be cut. All sprouting hardwood stems not selected as leave trees and all surplus trees up to 6" DBH would be cut. For matrix, vigorous and well-formed conifer leave trees would be maintained at an average spacing of 16' by 16' spacing (+/- 25%). Non-tanoak hardwood sprout clumps would be thinned to the single largest stem and spaced at 25' apart in the matrix. For non-tanoak hardwoods other than madrone within Riparian Reserves, sprout clumps would be thinned to the single largest steam and spaced 25' apart. Within Riparian Reserves, selected sprouting madrone clumps would be cut back to three (3) stems and spaced at 25' apart. Criteria for selecting which stems to leave would be based on largest diameter at 2' above ground level, best formed, straightest, and with the best formed crowns, and origins closest to the base of the stump. As noted in Tables B-1 and B-2, some of this work may be accomplished with a Slashbuster.

*(3) Pruning (PR)* - This work consists of selecting and pruning the largest, healthiest, best formed and least damaged conifers between 3" and 10" DBH to an average 16' x 16' spacing (approximately 170 trees / acre). Trees would be pruned to a maximum height of 9'. All live and dead limbs, whiskers, and lateral sprouts would be removed using pruning shears or loppers to within ¼" of the main bole. Cut branches would be lopped and scattered so the slash height is no more than 2' above the ground. Pruning would not be done in the first rows of trees along paved or rocked roads. Pruning would not be conducted in riparian reserves.

*(4) Slash treatment* – Project created slash would be evaluated for hazard reduction treatment need. Evaluation would be based on the level of the fuel hazard, the wildfire risk, and values of resources within stand and in the adjacent area. All acres may not be treated. The most common slash treatment would be hand pile and burning (HP). Other treatment options include lop and scatter (LS) or removal of slash as poles or firewood. Slashbusters (SB) may be used for slash treatments.

### 2.2.8. Older Seral Stage Stand Treatments – Alternatives 2 and 3

#### a. Stand Treatment Objectives

The primary objectives of the proposed harvest treatments the action alternatives are to reduce stand densities, perpetuate the historic mixture of tree species, promote multi-layered stand structure, reduce the risk of a stand replacing fire, and to contribute to the BLM's commitment to provide timber / forest resources to the local economy.

- Reduce stand densities: growth stagnation, resulting from abnormally high tree densities render even the dominant trees highly susceptible to bark beetles, defoliating insects, dwarf mistletoe, and root diseases (Knutson et. al. 1986; Byler and Zimmer-Grove 1991; Cochran and Barrett 1995; Filip et al. 1999). Reducing tree density will increase individual tree vigor, which will increase stand resistance to insects and diseases. This will increase the long-term integrity of the stands by ensuring only small-scale (natural) insect and disease attacks occur.

- Perpetuate the historic mixture of tree species: fire exclusion has created a shift from fire-tolerant (ponderosa pine and black oak) to less fire-tolerant species (Douglas-fir)(Atzet 1995). Pines and black oaks require openings to regenerate and the pre-fire exclusion cohorts

(overstory trees) are experiencing intense competition (reduced vigor) from abnormally high tree densities.

- Promote a multi-layered stand structure: retention of multiple-layers introduces stand complexity through the creation/retention of snags, down wood, large vigorous hardwoods, and understory vegetation diversity (Tappeneir and McDonald 1979; Berg 1996; White 2001).

- Reduce the risk of a stand replacing fire: density, composition, surface fuels and fuel arrangement are factors which influence fire behavior that can be directly manipulated to reduce the risk of a stand replacing fire (Agee 1993; Graham et al. 1999). Treatments are designed to achieve a lower canopy bulk density (related to stand density and composition), reduce surface fuels and increase canopy base height.

b. Description of the Proposed Treatment Alternatives

Two alternatives are differentiated by their extent of treatments: inclusion of a particular stand / unit would be determined by a prioritization based on stand health, stocking levels, fire condition class, wildlife concerns, and ease of access for post-harvest vegetation treatments.

1) Alternative 2

This alternative includes treatment of both high and low priority stands (approximately 569 acres including approximately 115 acres of riparian reserves). These units and their proposed treatments are listed in Table B-1.

2) Alternative 3

Alternative 3 proposes treatments of approximately 1,242 acres. Units are the same as in Alternative 2 ***except***: it excludes units that do not currently have BLM road access necessary to support vegetation (silvicultural or fuels) treatments; and it excludes low priority treatment units where vegetation treatments are judged not to be currently warranted (*e.g.*, stand conditions don't require intensive or immediate treatment for forest health or hazard reduction over the next 5 years, stands where effective vegetation treatment would be so costly that the current successional trend is left to take place (*e.g.,* high density tanoak stands), or which may be judged to be less in need of forest health or wildlife restoration treatments based on an assessment of forest health conditions, and fire condition class. These units and their proposed treatments are listed in Table B-2.

3) Silvicultural Treatments proposed for Alternatives 2 & 3

*Commercial Thinning/Modified Group Selection* (CT/MGS/) - This treatment would remove merchantable size trees (7" DBH or greater) that have slowed in growth or are subject to mortality. Also, this treatment would insure that non-tanoak hardwoods and pine components would be developed for species diversity. The following is a more specific discussion of the objective and a description of this treatment:

- C*ommercial thinning* focuses on retaining the most vigorous dominant and co-dominant overstory trees, while also retaining smaller vigorous intermediates for future stand development. Vigorous ponderosa and sugar pines would be the preferred leave trees in order to retain species

diversity and prolong the survival of these species. Large vigorous hardwoods would be retained and released by thinning around them. Spacing of the residual trees would use the crown radius of the healthiest dominant and co-dominant trees to achieve an average relative density of 0.35 (35%).

- *Modified group selection* is the removal of trees around selected pine or non-tanoak hardwood trees. This treatment removes those trees (usually Douglas-fir) that are competing with vigorous pines and non-tanoak hardwoods. It favors and retains large vigorous Ponderosa and sugar pines with greater than 30% live crown ratio and non-tanoak hardwoods. It is intended to increase the potential for pine or non-tanoak hardwoods surviving and regenerating. In small patches (<3 acres), which lack conifer regeneration because of intense hardwood competition, a "regeneration opening" would be created by cutting and removing large tanoaks or burning them on site when yarding is not feasible. No more than 5 patch openings would be created within this project. These openings would be planted with conifer seedlings (scalping and subsequent seedling maintenance would occur as needed).

*Post Harvest Treatments for Harvest Units* - After logging is completed, all action alternatives would include subsequent treatments as follows:

- When young trees are severely damaged, over-stocked, suppressed and not likely to respond to release, or are not selected as leave trees they will be severed (slashed). Trees selected for slashing (generally those trees ≤8" DBH) would include small suppressed trees within the drip line of large residual trees. By severing the stems of the suppressed competing conifers and hardwoods, the plant competition for water and soil nutrients would be lowered.

- The understory vegetation would be selectively thinned (UT), retaining the healthiest and most vigorous trees. The density of competing vegetation would be reduced by thinning understory trees (≤8" DBH conifers and ≤12" for hardwoods) to an average 20' spacing (±25%). Non-tanoak hardwood trees would be selected for retention over tanoak trees of relatively the same size. Hardwoods would be spaced out to an average 25' spacing (±25%). Species diversity would be maintained by selectively slashing hardwoods, conifers and shrubs, while reserving specified species. Wider spacing would be used when leave vegetation is larger sized or includes species such as pine or oak which thrive at their healthiest state in less dense conditions.

- Prescribed fire would be used to reduce or remove logging and thinning slash. This treatment would under burn (UB) and / or hand pile and burn (HP) the tree limbs and other debris on the ground after logging and thinning work is completed. Alternatives to burning would be evaluated in each area and might include other treatments such as utilization, lop and scatter, or the utilization of a mechanical slashbuster.

### 2.2.9. Fuel Hazard Reduction Treatments (Alternatives 2 & 3)

a) Objectives:

Treat hazardous fuels, using appropriate tools, to reduce the threat of wildland fire to communities and and forest resources. Within a National Fire Plan delineated Community at Risk (CAR), the objective is to reduce fuel loads and change fuel profiles to reduce fire intensity, to improve the defensibility of the homes located within the CAR, and to provide for wildland fire fighter and public safety. Within the Wildland Urban Interface (WUI) (1.5 mile outside of CARs), the objective is to provide defensible space adjacent to CARs and to reduce the potential for high intensity wildfire.

b) Proposed Fuels and Prescribed Burning Treatments

Alternatives 2 and 3 differ in the units treated for fuel hazard reduction. These units, with the proposed fuel hazard reduction treatments, are shown in Table B-1 and B-2. In many instances, multiple treatments are indicated. These may be accomplished with multiple entries. An example of this would be to slash, hand pile, and hand pile burn followed with a broadcast or underburn. Managing fuels requires a long term commitment. Most areas will require periodic maintenance treatments if the lower fuel loads / fuel hazard are to be maintained over the long term. Maintenance treatments could be necessary in 3 to 10 years from date of initial treatment.

Treatments will be prioritized as follows: 1) timber harvest units and PCT / brushing units, 2) BLM lands within CARs, 3) WUI areas, and 4) outside of WUI.

*Prescribed Burning* –

- *Underburning or Understory Burning* (UB) - This is the application of prescribed fire within areas where residual trees are present. The primary objective of this type of prescribed fire is to reduce both natural and activity fuel hazards. This includes the reduction for both dead and down woody material including those existing fuels on the site and those created by other management activities along with reducing ladder fuels present. Ladder fuels consist of both live and standing dead vegetation such as shrubs and small trees in the understory and live and dead branches close to ground level on overstory trees. The burn is designed to be of a lower intensity nature over the majority of the burn area. It would create a "mosaic burn" effect which will result in up to 20 - 30% of the total burn treatment area with minimal to no fuel consumption. This will reduce the loss of large woody debris, organic matter, and retain pockets of vegetation. Burning is conducted at anytime throughout the year when fuel and weather conditions will permit the successful achievement of resource objectives. Burning is typically conducted from October into November and March into May. Summer or early fall burning is less common, but can be feasible when needed to meet resource objectives and when escape fire risk can be mitigated. Underburning would be timed based on considerations such as weather and fuel moisture conditions to insure treatment and resource objectives are met (e.g., low intensity burns are done).

- *Broadcast burning* (BB) - In general, broadcast burning is similar to underburning without an overstory and is done for ecological purposes, benefiting wildlife and botanical habitat restoration and enhancement. These treatments are designed to reduce both live and dead fuel, lower the fuel hazard and increase the value of vegetation conditions for wildlife (palatability and nutritional value) and botanical habitat.

Both underburning and broadcast burning generally require some type of control line or fire line. When possible, natural and existing control features such as roads, trails, rock outcroppings, changes in fuels, streams, riparian areas, and other natural and human-made barriers are utilized to check and control the fire spread. When such barriers are not available, fire line must be constructed. The most common barrier is handlining (fire line constructed using hand tools such as chainsaws, pulaskis, and shovels). Most handline consists of removal of all fuels down to mineral soil for a width of 1-3'. The width of the line depends on the fuel type the line is constructed through, with narrower line in light fuels such as grass or duff and wider line in heavier fuels such as high loadings of downed woody

material and brush. Position on the slope and topography are other factors controlling the size of the handline. Waterbaring is used on fire lines where slope exceeds 10% to control water runoff and limit potential erosion. Hoseline may be used in conjunction or independently of the fireline. In riparian areas, hoselines maybe used independently to put down a wet line to reduce the extent of the fire backing into identified areas.

*Hand Piling and Burning* (HP)- This treatment is designed to remove approximately 50 - 75% of the fuel 1 - 8" in diameter and greater than 2' in length. Fuel outside this size range is left untreated, however some smaller fuels are included in the piles to facilitate ignition. Piles are covered with plastic to create a dry ignition point. Piles are burned in the Fall to Winter season after 1+" of precipitation to reduce the potential for fire to spread and to reduce the potential for scorch and mortality to residual trees and shrubs.

*Understory Thinning / Slashing* (SL)- All live, standing vegetation 1 – 8" DBH shall be completely severed with the stump height not to exceed 4". The individual prescription may designate a different size within this range for individual units (example: slash 1-4 or 2-8" only, instead of the 1-8"), but not outside the 1 - 8" DBH range. Individual species may also be specified as reserved from cutting on individual units (see silviculture prescription). Slashing shall be accomplished throughout the entire unit, excluding areas identified as reserved from treatment. The resulting fuel (activity fuel) may be piled and burned or left and scattered. Slash not placed into piles will be lopped and bucked with the resulting slash to a maximum 8' length and a depth not to exceed 24".

*Slashbuster®* (SB)- Experience in southwest Oregon has demonstrated the utility of using large excavators equipped with a 30+ foot boom and a hydraulic chipping/shredding head (*aka* Slashbuster) to reduce fuel loading and fuel hazard. The machine mechanically shreds slash and/or live vegetation. Treatments can be adjusted to be similar to slashing and / or understory thinning. Dependent upon the size/power of the excavator and the respective slashbuster unit, standing material up to 18" diameter can be treated. The operator of the slashbuster can control the location of the chipping/shredding head and create buffers and meet specifications similar to selective slashing. The treatment immediately and substantially alters the fuel profile. This reduces the potential immediate need for prescribed burning and lowers burn intensities where prescribed fire has a role. It will result in fuel conditions that make fire suppression efforts easier in the event of a wildfire. Treatment costs are highly favorable as compared to the hand piling and burning treatments.

### 2.2.10. Wildlife Habitat Restoration and Enhancement – Alternatives 2 & 3

a. Objectives of the Treatments

A number of treatments are proposed with the purpose of restoring and enhancing certain wildlife habitats: Jeffery pine, and white oak woodlands. Treatment objectives are:

- restore a variety of plant communities to their natural range of conditions;
- reinvigorate and maintain chaparral and, therefore, the species dependent on chaparral;
- reinvigorate the indicated habitats in those areas where they have become largely senescent, overly dense, or where they are declining due to encroachment by fire intolerant species.

b. Proposed Treatment

*Jeffery pine treatments* include the use of prescribed burns and/or mechanical means to restore Jeffrey Pine savannahs by reducing the encroachment of Douglas-fir, incense cedar, and shrubs such as ceanothus and manzanita. Decadent brush would be targeted for removal, as would all conifers except vigorous pine and large limbed, open grown Douglas-fir. Burning would be done when conditions allow for a cool prescribed burn (fall, winter or early spring). Manual treatment with chain saws may be done prior to burning to reduce potential negative impacts such as the threat of escape and to reduce fire severity. Some treatment may be accomplished with slashbuster, followed by prescribed fire within several years. Ignition would most likely be accomplished through ground ignition (drip torches or fusees). However, aerial ignition methods may also be used (e.g. helitorch or a plastic sphere dispenser). Small temporary fire lines may need to be constructed on the edge of the savannahs. Firelines will be constructed with hand tools (e.g., shovels, chainsaws, axes, and pulaskis).

*White oak woodland treatments* would include a combination of mechanical and prescribed burning treatments. Decadent brush would be targeted for removal, as will small oaks (≤10"DBH) and invading conifers (≤8"DBH). Trees larger than these diameters would either be harvested (where economically viable) or girdled to meet the desired density of 40 to 80 $ft^2$ of residual basal area. Cut material would be piled when necessary and/or disposed of by underburning. Stems ≤1" in diameter measured at 1' above ground level would not be slashed. Burning would be done when conditions allow for a cool controlled burn (fall, winter or early spring). Mechanical treatment with chain saws may be done prior to burning to reduce the threat of escape and to reduce fire intensity.

The following descriptions are proposals in two typical plant communities in the project area: oak woodlands, and Jeffrey Pine savannahs. All of the units proposed for treatment are listed in Tables B-1 and B-2 and are identified as Wildlife Habitat Restoration and Enhancement and treatments are described in the Understory Treatment column.

1) Alternative 2

Implement restoration and enhancement treatments on both high and low priority sites as described in Table B-1.

2) Alternative 3

Implement restoration and enhancement treatments on only high priority sites as noted in Table B-2. No restoration treatment would occur in the proposed RNA.

### 2.2.11. Roads and Transportation Management - Alternatives 2 & 3

Proposed road treatments address roads that would be used to support the activities included in this project. Some roads in the project area that are not necessary for project implementation may also receive some maintenance treatments.

a. Objectives -

- Minimize permanent road construction, utilizing temporary spurs.
- Employ the Best Management Practices as described in the RMP for the design, construction, renovation, and maintenance of roads.

b. Description of the Proposed Road Work-

The proposed road work is outlined in Table C-1 (Appendix C). Roads are shown on Map 2 (Appendix A). The table lists the roads that would be used, constructed, improved, and renovated as a part of this proposed project. Most of the proposed construction, improvement, and renovation work would be accomplished as a part of the commercial harvest and vegetation treatment actions.

## 2.3. Project Design Features

Project design features (PDFs) are included in all the action alternatives for the purpose of reducing potential adverse environmental impacts which might stem from the implementation of the proposal. The PDFs noted below would be a part of all of the action alternatives, unless otherwise noted.

### 2.3.1. Logging Systems

To reduce the extent of ground disturbance and soil compaction, yarding tractors would be limited to the smallest size necessary to do the overall job. Tractors would be equipped with integral arches to obtain one end log suspension during skidding of the logs. Tractors would be equipped with a 60+' bull line and would be restricted to approved skid trails. Pre-existing skid trails will be selected whenever possible. Tractor logging would be restricted to slopes ≤35% although short pitches that exceed 35% would be permissible if necessary. Tractor-type logging equipment would not be authorized when soil moisture content, at a 6" depth, exceeds 25% by weight as determined by a Speedy Moisture Meter.

Skid roads would be water barred in a manner appropriate to the slope and soil type. Main tractor skid trails would be blocked where they intersect haul roads.

In cable yarding units, step landings would not be permitted. Cable yarding corridors would be located away from draws. Cable yarding corridors would be waterbarred when needed and at spacing appropriate for the slope and soil type.

Large limbed trees would be limbed in the units prior to cable yarding to reduce damage to the residual stand and to reduce soil disturbance.

All landings, including fill slopes would be located away from headwalls and draw bottoms and adjacent draw side slopes. All natural surface landings constructed during the logging operation would be de-compacted except those located on rocky ground and those planned for future use. Landings would be seeded and straw mulched with an erosion control grass and legume mixture (or native grass seed when available) upon completion of the harvest activity and before the onset of the rainy season. Within riparian reserves, main skid trails would be decompacted. Existing skid trails would be used where ever feasible (Alternative 2 only).

Helicopter operations will be restricted to the hours of 0700 to 1700, Monday through Saturday, with Sunday work prohibited. No work would be permitted on Christmas or New Years.

### 2.3.2. Soils

There will be no harvest on slopes with unstable soils showing active movement. On serpentine influenced soils and other soils that may exhibit possible instability, root stability will be maintained and used as a guideline to determine harvest treatment.

### 2.3.3. Seasonal Operation Restrictions

Table 2-4 outlines seasonal operating restrictions that would be implemented.

**Table 2-4: Seasonal Operating Restrictions**

| Location | Restricted Activities | Restricted Dates | Reasons / Comments |
|---|---|---|---|
| Entire project area | All logging, log hauling operations. Special forest product activities | Oct. 15 to May 15 of following year | Erosion Control.<br>Some variations of the dates would depend on weather and soil moisture conditions. |
| Infested POC areas | All operations (including but not limited to logging, log hauling, road work, precommercial thinning, bough collection, pole harvest and brushing) | Oct. 15 to June 15 of following year.<br>Due to the limited window for fuels treatments and planting, these activities could occur between Oct. 15 and May 15 | *P. lateralis* control. Equipment washing would be implemented during wet season operations.<br>Some variations of the dates depending on weather and soil moisture conditions |
| 1/4 mile radius around active spotted owl nest sites. | All timber harvest activities (felling and yarding), chainsaw operation and prescribed burning | March 1 to June 15 (or later if deemed necessary) | Dates and restriction dependent on nesting status. (Rogue River/South Coast Biological Assessment, 1998) |
| Entire sale area - 1/4 to 2 mile radius around any raptor nest | All timber harvest activities (felling and yarding) and chainsaw operation. | Variable depending on the species | (BLM Instruction Memo OR-99-036). |
| All harvest units and road construction ROWs. | Various activities depending on the species | Variable depending on the species | Restrictions only if special status species are located. (BLM Instruct. Memo OR-99-36) |

### 2.3.4. Fire and Fuels Management Treatments

A Prescribed Fire Plan is prepared that includes both resource and fire objectives. Fuel moisture and weather parameters are developed based on these objectives. The timing of the burn is based on achieving these objectives, occurrence of the parameters, predicted weather, and the availability of adequate fire suppression resources as a contingency plan in the event of fire escape. Prescribed fire plans include design features to meet objectives and minimize potential of a fire escaping from control lines; to insure that weather parameters and fuel conditions are such that fire behavior can be readily suppressed by forces on site; and to determine escape contingency requirements.

Prescribed burning would be managed in a manner consistent with the requirements of the Oregon Department of Forestry's Smoke Management Plan and the Department of Environmental Quality's Air Quality and Visibility Protection Program. Additional measures to reduce the potential level of smoke emissions would include: mop-up to be completed as soon as practical after the fire. Burning with lower fuel moisture in the lighter fuels (1 and 10-hr tlf) to facilitate quick and complete combustion with burning of larger fuels (1000 and 10,000-hr tlf) under higher moisture levels to minimize consumption is desirable. These conditions typically occur in the spring. In the fall, the larger fuels will be drier, resulting in higher levels of combustion, but at a more efficient level. Covering handpiles allows burning during the rainy season where there is a stronger possibility of atmospheric mixing and smoke dispersal.

All areas planned for prescribed fire treatments that contain sensitive plant species would be burned

under the weather and fuel conditions and/or season that minimize impacts on plant reproduction and active growth.

All proposed treatment units would be re-evaluated following logging or other vegetation treatment by an interdisciplinary team of resource specialists to insure that the slash/fuel treatments are appropriate for the post harvest/treatment condition. The fuel treatments noted in Tables B-1 and B-2 reflect the current best estimate of fuel treatment needs. Treatments in harvest units would be changed if it appears that something different would better accomplish fuel treatment and/or site preparation needs while reducing the potential adverse impacts on air quality and site productivity.

Prescribed Fire Escape - To prevent fire from escaping control and to minimize potential damage to overstory trees, burning would occur during the late fall to early spring season when weather and fuel conditions allow the least active fire behavior.

Patrol and Mop-up of burned areas would occur to prevent areas from reburning and becoming escape fires. All water used in prescribed fire activities would come from BLM approved sources. Sources where *Phytophthora lateralis* has potential to occur will be treated through approved methods.

#### 2.3.4.1 Slashbuster Use

The slashbuster machine would be restricted to slopes less than 35%. Operating on short pitches greater than 35% would be permissible.

Only low ground pressure (<4 psi) machinery equipped with semi-grouser tracks would be permitted. The shredding head would be mounted on an articulated boom of no less than 30' in length.

Slashbuster operations would be permitted only when soil moisture content is (a) ≤25% at the 6" depth on non-serpentine soils, or (b) ≤25% at the 8-12" depth when working on serpentine derived soils.

Pre-existing coarse wood material greater than 10" diameter and snags would not be shredded as part of the slashbusting operations. To the greatest extent possible, this material would be left undamaged. If a snag is felled for safety reasons, it would be retained on site.

No slashbuster operations would be conducted within special status plant site buffers. Chipped and shredded material would be kept out of these buffers to the extent possible.

In those portions of a unit where the slashbuster is precluded from operating (e.g, special status species buffers, areas of excessive slopes, no treatment zone of riparian reserves, etc.), slash/fuel treatments would be accomplished by hand in the manner indicated in the EA.

In all slashbuster treatment areas, approximately 10% of each unit would be left untreated. Untreated areas would be at approximately one (1) acre in size and well distributed across the unit. Where they exist, no-treatment special status species buffers may be considered as untreated areas for this purpose.

Cultural / historical features would be buffered and the slashbuster treatments would be precluded from within the buffers. Mining ditch crossings would occur at approved locations only.

When treating riparian reserve vegetation, slashbuster treads will be kept at least 50’ from the stream

channel. The exception is adjacent to intermittent streams in the Jeffery pine / white oak series where slashbuster treads may come as close as 25' to the channel. The slashbuster would cross streams only at approved crossings: where culverts are in place or where low, armored banks exist.

A follow-up low intensity (fall/winter/spring) underburning of the slashbuster treatment areas would be conducted within a 5 year period after the mechanical slashbusting treatment if post treatment fuels assessments indicates the need to meet fuels reduction and stand / unit resource objectives (e.g., wildlife habitat conditions.

### 2.3.5. Roads - Construction, Improvement, Closures, Dust Abatement

All new road construction and improvement would be done at the minimum standard appropriate to the intended long term use of the road. Proposed road closures and decommissioning are intended to reduce the potential for erosion and to reduce the impacts on wildlife. Spur roads proposed for decommissioning needed to support the prescribed burning / fuel reductions would have the decommissioning scheduled after burning is complete.

Dust created from log hauling traffic on roads would be abated when conditions are warranted in order to reduce driving hazards and protect the fine surfacing materials which bind the road surface rock thus increasing its longevity. Dust abatement would be in the form of water, lignin, or reduced vehicle speed. All water used would come from a BLM approved water source that does not contain *Phytopthora lateralis*.

### 2.3.6. Stream and Riparian Habitat

Riparian reserve widths would follow the Standards and Guidelines in the NFP (p. C-30) and the RMP.

Directional falling away from streams and lining to designated skid trails would be used within riparian reserves to minimize ground disturbance. Existing skid trails would be used whenever possible. Main skid trails (those which are used for more than 2-3 passes) would be decompacted and covered with slash or debris. Skid trails and landings used within riparian reserves would be decompacted and covered with slash or debris if not already recovering naturally.

Thinning, burning (with the exception of a backing burn) and brushing would not occur within a designated "no treatment" area immediately adjacent to each side of the stream bank. (See Table 2-3)

Handpiles within 25' of a stream channel or in the bottom of a dry draw would not be burned. Slash created adjacent to streams during vegetation treatments could be lopped and scattered instead of prescribed burning.

### 2.3.7. Wildlife Trees and Dead and Down Material

All snags ≥16" DBH would be reserved from cutting in all units, unless they pose a safety hazard. If a designated snag/wildlife tree must be cut due to worker safety concerns, the tree would be left in the unit and a replacement standing snag would be identified.

Coarse woody debris (CWD) that is already on the ground would be retained and protected from disturbance to the greatest extent possible during logging, burning and other project activities.

### 2.3.8. Botanical Resources

For Special Status species, the size of the protection buffer will be determined on a case-by-case basis, depending on the species and its habitat requirements but will be at least 25' radius. Burns in areas containing special status plant species would follow prescriptions that would result in cool burns which would minimize potential damage to plant populations. Prescribed fire operations would be done in manner which strives to reduce or eliminate burning through identified Special Status plant population areas depending on the adaptability of each species to fire.

The project design criteria (PDC) for T&E listed species (*Fritillaria gentneri* and *Lomatious cookii*) are provided in the USFWS's 2003 BO:

(1) Buffer sizes: a minimum of 25' radius from the population boundary (a site or the outer edge of a polygon encompassing the population). No activity within the buffer.
(2) No heavy equipment, skidders, yarders, etc. within 75' of a buffer (100' from occurrence).
(3) No tree falling into or yarding through buffered sites.
(4) Do not locate anchor trees within known sites.
(5) Construction of new landings would be at least 300' from known sites.
(6) Proposed logging road location, including temporary haul roads, would be surveyed and populations protected by a minimum 100' radius buffer. Use of existing roads within 100' of occurrence is allowed.
(7) Firewood collection would <u>not</u> be permitted within buffers. Road segments close to known occurrences may need to be closed to prevent incidental impacts.
(8) Buffer sizes for thinning (commercial, oak woodland and riparian thinning) should be a minimum of 25' from the population boundary. Buffers can be treated manually during the dormancy period (September – February).
(9) Cut materials must be piled outside the buffers.
(10) For mechanical thinning with a slashbuster, 100' radius buffers would be required. No vehicles or heavy equipment within buffers.
(11) No tree planting or mechanical scalping in or within 75'of the buffer edge (100' from occurrence) so as to maintain more open habitat.
(12) Known occurrences can be treated (burning, hand brush/tree removal, sowing adapted native grasses etc) during the dormancy period if the net result improves habitat for the species. No heavy equipment (dozers, slashbuster, excavators etc) within known sites. Known sites will be protected by 100' buffers from heavy equipment.

### 2.3.9. Wildlife Resource

If Survey and Manage (S&M) species are located within project area, protection measures would be implemented in accordance with the management recommendations. S&M wildlife sites will be buffered according to the NFP management recommendations. Buffer size and strategy will be species and site specific per the management guidelines.

Consultation with the USFWS regarding any T&E listed species potentially impacted by the project will be completed as required by the ESA prior to a final decision for the project. Subsequent or additional consultation would be conducted if: (1) new information reveals that the effects of the

proposed action may affect listed species or critical habitat in a manner or to an extent which was not considered in the biological opinion; (2) the proposed action is subsequently modified which causes an effect to a listed species or critical habitat in a manner or to an extent not considered in the biological opinion; or (3) a new species is listed or critical habitat is designated that may be affected by this action.

Known Del Norte salamander sites would receive a one site-potential tree or 100' horizontal distance (whichever is greater) buffer. (RMP p. 47) Within the site and its surrounding buffer, maintain a minimum 40% canopy closure and avoid any activities that would directly disrupt the surface talus layer. Partial harvest within a buffer may be possible if a minimum 40% canopy closure can be maintained; in such cases, tree harvest must be conducted using helicopters or cable systems to avoid compaction or other disturbance of talus. Precommercial thinning, slashing and prescribed burning treatments within the buffers would also need to maintain a minimum 40% canopy closure. Prescribed burning in buffers would occur only when temperatures are at or below freezing to avoid direct mortality to salamanders. Trees would be directionally felled away from these buffers.

### 2.3.10. POC Root Disease

Port-Orford-cedar in the project area will be managed according the May 2004 BLM POC-FSEIS/ROD. Per this ROD, a risk key will be prepared outlining the environmental conditions under which one or more disease-controlling management practices will be implemented.

Prior to entering a Port-Orford Cedar (POC) area or leaving a *Phytophthora lateralis* (PL) area, all vehicles, tractors, skidders and yarders involved in road work, and harvest operations, will be washed according to Management Guidelines provided by the Port-Orford Rangewide Assessment (USDA-USDI Goheen, Betlejewski and Angwin 2003). The FEIS for Management of Port-Orford-Cedar in Southwest Oregon provides a risk key for managing while in the natural range of POC. The risk key requires the application of mitigation measures if uninfected POC are within, near or downstream of the activity area…would preclude meeting resource management plan objectives or if spread is likely to other ecologically important areas or if the activity is within an un-infested 7th field watershed (USDA-USDI 2003). The following mitigation measures are intended to address this risk key by lessening potential spread and infection of more POC trees within the project area.

The project area is <u>not</u> in an unifested 7th field watershed. No commercial treatments are planned in stands with POC but there is both infected and uninfected POC along one or more of the haul routes that will be used to access stands in T41S,R9W, Sections 10 and 12. Prior to and after the commencement of logging in these sections all equipment will be washed and inspected. The operations will also be limited to the dry season in these harvest units (Table 2-4).

Vehicle and equipment washing would be required of site preparation and burning crews. Unit scheduling will be done to prevent moving from an infested area to a non-infested area. To limit the potential for PL spread by these crews, access and egress routes and parking areas will be designated by the BLM representatives.

### 2.3.11. Cultural Resources

Cultural sites located within the project area would be buffered. Buffers would be established sufficient to protect the features of the site from adverse impacts of any proposed management

activities. Buffers would be designed by archeologists or cultural resource specialists. Timber that is to be removed next to a buffer will be directionally felled away from buffers.

Along ditches and existing trails directionally fall timber away from the ditch/trail system and preserve ditch berms. In Alternative 2, the National Register listed ditches would be breached only at location identified by a cultural resource specialist. In Alternative 3, the National Register listed ditches will not be breached. The non-listed ditch would only be breached at locations identified by a cultural resource specialist. All ditches would receive a 50' no treatment buffer.

Along Logan Cut: understory thin (UT) and handpile and burn (HP) only within 25-50' of the edge of outer gorge.

The Waldo Cemetery would receive a 200' no treatment buffer on its west side. No treatment is proposed on the east side of the

If any unrecorded cultural sites are located during project implementation, no treatment would take place around them until review by a cultural resource specialist.

# 3.0. Chapter 3 - Environmental Consequences

## 3.1. Introduction

Only substantive site specific environmental changes that would result from implementing the proposed action or alternatives are discussed in this chapter. If an ecological component is not discussed, it should be assumed that the resource specialists have considered effects to that component and found the proposed action or alternatives would have minimal or no effects. Similarly, unless addressed specifically, the following were found not to be affected by the proposed action or alternatives: air quality; areas of critical environmental concern (ACEC); cultural or historical resources; Native American religious concerns; prime or unique farmlands; floodplains; endangered, threatened or sensitive plant, animal or fish species; water quality (drinking/ground); wetlands/riparian zones; wild and scenic rivers; and wilderness.

This project is not located within the Oregon State Coastal Management Zone (CMZ) nor has it been identified by the State of Oregon's Land Conservation Development Commission (LCDC) as a project (by type and geographic location) outside of the CMZ but still needing a consistency review.

## 3.2. Site Specific Beneficial or Adverse Effects of the Alternatives

### 3.2.1. Resource: Soil / Water

a. Affected Environment

1) Watershed

The West Fork Illinois is a 78,000 acre 5th field watershed containing five subwatersheds including Elk Creek, Lower WF Illinois, Middle WF Illinois, Rough and Ready Creek, and Whiskey creek. There are no key watersheds in the West Fork Illinois basin.

There are two geologic formations leading to two distinct soil types in the watershed. These are separated by a northeast trending fault which divides the watershed into the western and eastern areas. The western area of the watershed is dominated by serpentine soils which contain high levels of magnesium, iron, nickel, chromium, and cobalt. Due to the high ratio of magnesium to calcium, soil productivity is low and vegetation sparse. Serpentine soils are typically shallow; water holding capacity is low. In contrast, the eastern area comprised of Pollard-Abegg and Josephine-Pollard soils are deep and well drained.

The West Fork Illinois is a rain dominated hydrologic system. The Mediterranean climate produces a precipitation pattern of 58" in the northeast to 130" in the far west with the majority of precipitation falling between December and March. Accordingly, peak flows occur during the winter months. Due to the dominance of serpentine soils, streamflows in the western area of the watershed are particularly "flashy" (i.e., rapidly rising and falling with the onset and cessation of rainfall). Eastern area soils are typically deeper and have a greater vegetative cover than the western area; streamflows are not as responsive to precipitation.

Moderate peak flows (2 to 5 year flood return interval) result from intense winter rainstorms. Peak flows of record such as the 1964 and 1974 flood events resulted from rain on snow events. Flood

events create widespread bank erosion and channel adjustment in the lower gradient floodplain reaches. While bank erosion is a natural occurrence, riparian vegetation removal and channel straightening to the floodplain areas of the West Fork Illinois and Elk Creek, has greatly reduced the ability of the floodplain to dissipate flood energy. Consequently, channel banks are the primary energy dissipater, resulting in accelerated bank erosion.

As with peak flows, baseflows differ between the eastern and western areas of the watershed. With shallower soils in the western area their ability to store water decreases, resulting in lower summer flows. Within the areas of serpentine soil, seeps and spring surface along bedrock planes. While the seeps and springs do not contribute to baseflows, they provide important sources of water for unique fen wetlands. Surface flows in the western area are also reduced by large cobble deposits at the mouths of tributaries. Rough and Ready and Rock Creeks are notable examples. In these instances, water flows subsurface below the cobble deposits. Baseflows are generally higher in the eastern area due to greater water holding capacity in the upslope area and the absence of course soil deposits near the mouth.

Baseflow levels have been greatly altered due to consumptive use for agriculture. According to the Oregon Department of Water Resources no water is available for future water rights claims. In other words, surface waters in the West Fork Illinois are fully appropriated. As a result of the low flow conditions, West Fork Illinois was listed as water quality limited due to flow modification. Exacerbating the effects of surface water diversions on baseflows are groundwater withdrawals. While not quantified, hundreds of wells in the watershed pump groundwater for domestic, landscaping, and irrigation use. Often water withdrawn from wells is hydrologically connected to the surface water. In these instances ground water is removed that would have flowed subsurface, discharging into streams.

In the Pacific Northwest roads have been identified as mechanisms responsible for increased peak flows. Specifically, roads intercept subsurface flow which route the flow directly to the stream channel via road ditches and culverts (Wemple et al. 1996). Road densities vary by location and ownership in the West Fork Illinois drainage. The average road density for the watershed is 2.6 $mi/mi^2$ of the drainage or approximately 2% of the basin. The average road density on BLM land is 1.16 $mi/mi^2$ and on non BLM land 2.7 $mi/mi^2$. At these road densities elevated peak flows in the West Fork Illinois are very unlikely. For comparison, (Jones and Grant 1996, Jones 2000) found no statistically significant increases in peak flows attributed to roads alone in watersheds with road densities of 4.7 $mi/mi^2$ and 5.7 $mi/mi^2$. Similarly, Ziemer 1981 found no changes to the hydrograph when roads occupied 5% of the basin. Road effects on peak flows were detectable when 12% of the watershed was roaded (Harr et al. 1975).

Changes in vegetation patterns have also been linked to increased peak flows. Loss of evapotranspiration (plant uptake of soil moisture) from forest clearing leads to higher soil moisture allowing a greater percentage of precipitation available for surface runoff. In the West Fork Illinois Watershed, timber harvest and fire suppression are primarily responsible for changes in forest vegetation. The former decreases vegetative cover and the latter increases vegetation density. Timber harvest in the watershed shifted some forest stands from older mature forests to younger smaller tree stands. Approximately 3% of BLM and private ownership is in an early seral sapling/pole vegetation class. Ten percent of the West Fork Illinois is in a brush classification (USDI BLM 2003). A majority of the brush classification occurs in the serpentine soils in the western area and is considered a natural condition.

Fire suppression has led to an increase in forest stand densities. Conifers are encroaching into open stands such as oak woodlands, meadows and savannahs (USDI BLM 2003). A reduction in low intensity fires has also lead to an increase in understory vegetation by shade tolerant species such as tanoak, white fir and Douglas-fir. Forest conditions due to fire suppression apply equally to both riparian and upland species.

During the summer of 2003 the Biscuit fire burned 22,000 acres in the WF Illinois, predominately in the Rough and Ready subbasin. The fire was located within the wilderness area on forest service administered land.

2) Water Quality

The Oregon Department of Environmental Quality (ODEQ) gathers and assesses water quality data for streams in Oregon. Since 1988, ODEQ has maintained a list of streams (the 303(d) list) that do not meet water quality standards. These streams are considered "water quality limited", meaning that beneficial uses of the stream are adversely affected by water quality conditions. The West Fork Illinois River has four stream segments listed on the 303(d) list. Table 3-1 displays the stream, water quality parameter not meeting standards, and beneficial use effected. Primary activities affecting water quality identified by the ODEQ were riparian vegetation removal, residential and agricultural development, channel widening, and water withdraws.

Table 3-1. West Fork Illinois 303(d) listed streams

| Stream Segment | Parameter | Beneficial Use |
|---|---|---|
| West Fork Illinois River: Mouth to California Border | 1) Flow Modification<br>2) Water Temperature | Consumptive use<br>Salmonid rearing |
| Elk Creek: Mouth to CA border | Water Temperature | Salmonid rearing |
| Rough and Ready Creek: Mouth to North/South Fork Confluence | Water Temperature | Salmonid rearing |
| South Fork Rough and Ready | Water Temperature | Salmonid rearing |

b. Environmental Consequences

1) Alternative 1

Under alternative 1 all current conditions and trends will continue. Risk is the environmental consequence of Alternative 1. The majority of the West Fork Illinois River Watershed is in fire condition class 2; 25% is in fire condition class 3. The classes indicate that the fire regimes have been significantly altered. Associated with the altered fire regime is a high risk of losing key ecosystem components to a large wildfire. If this were to occur, runoff of water and soil can be expected to increase. The amount would depend on the intensity and extent of the fire. This is particularly true on the western area which contains serpentine soils. High intensity fires in the riparian zone would greatly decrease stream shade and large wood recruitment potential.

2) Alternative 2

Alternative 2 proposes a combination of forest thinning and fuel hazard reduction in the brush and understory. Table 3-2 displays the acres of treatment by subwatersheds and the percent of watershed treated. The final row displays all acres of treatment and percent of the West Fork Illinois Watershed

treated.

| Table 3-2: Treatment Acres in each Sub-watershed | | |
|---|---|---|
| Sub-Watershed | Proposed Treated Acres | % of Subwatershed |
| Elk Creek | 751 | 4 |
| Lower West Fork Ill. | 541 | 4 |
| Middle West Fork Ill. | 827 | 5 |
| Upper West Fork Ill. | 750 | 8 |
| Watershed Scale | | |
| West Fork Illinois | 2,870 | 3 |

(a) Hydrology and Soil

As displayed in Table 3-2, only a small fraction of the watershed will be treated. In all treatment units, overstory and understory vegetation will remain; there will be no clearcuts creating large canopy openings. The commercial thin units were designed to accelerate growth rates in young stands and to release large conifer trees from overstocked conditions. Young stand treatments will retain trees at approximately 8'x8' and 16'x16' spacing. Older stand treatment strives to retain the healthy conifer overstory. Understory vegetation would be thinned to reduce competition for available moisture and nutrients. Again, a percentage of brush and small diameter trees will be maintained along with a healthy overstory.

There is one mile of new road construction proposed and 3.9 miles of road drainage improvement. Roads proposed would occur on ridge tops away from stream corridors. The proposed road upgrades would improve hydrologic function. New skid trails will be restricted to designated routes. Following use, the skid trails will be water barred, closed, or mulched with native seed, reducing water concentration and routing.

Considering the limited spatial extent of the proposed activities, minimal road development and retention of overstory and understory vegetation, there would be little or no effect to stream flows at the subwatershed scale. Likewise, there would be no cumulative adverse effects to the West Fork Illinois watershed as a result of implementing Alternative 2. The project would not increase the clearcut acreage in the watershed and would only minimally increase road miles. Nor would the project add to the effects of the 2003 Biscuit Fire which burned in the western edge of the watershed but not within the WF Illinois project area.

There is potential for minimal (very little, limited to few sites) short term effects on erosion in the Jeffery pine thinning units located in sections 9 and 33. The proposed treatment units are located on fragile serpentine soils. These soils are sensitive to compaction and subsequent erosion if heavy equipment is used when soil moisture content exceeds 30%. The Jeffrey pine units include prescribed fire and thinning brush and small diameter trees intended to reduce fuel loading and improve wildlife habitat. Vegetation ground cover would remain in all units. A mosaic vegetation pattern would result from the prescribed burn. The slashbuster, a very low impact (~ 4 psi) machine used to remove brush, mulches the brush and scatters the mulch over the ground surface, providing soil protection against erosion. There would be no skid trails or roads developed on serpentine soils; thereby, there would not be a routing path for sediment to creeks. A vegetation buffer along the stream channel would function to filter sediment entrained in overland flow.

(b) Water Quality

Alternative 2 proposes thinning and fuel reduction activities in the riparian zone. The Riparian zones identified for treatment have high stocking levels with consequent reduced stand resiliency and growth rates. In riparian areas that are over stocked, thinning will benefit water quality and aquatic conditions. As stated in the Sufficiency Analysis for Stream Temperatures (USDA, USDI 2003):

> *"Treatment in the primary and secondary zones may increase stand resiliency, improving sustainability of the riparian ecosystem. Treatment can maintain and restore species and structural diversity of forest stands, shift vegetation growth to more open stands consisting of evenly mixed age classes, provide for recruitment of large wood, and enhance habitat diversity and connectivity. From the standpoint of shade, treatment can increase vegetative growth rates, reducing the time for stream shade recovery and may enhance growth of residual trees and regeneration of understory, temporarily mitigating effects of short-term reductions in overstory shade. Treatment of the secondary shade zone can reduce the risk of natural disturbance, thus reducing the risk of vegetation loss in the primary shade zone in the event of a catastrophic disturbance."*

Additionally, the Illinois River TMDL Assessment Report: Riparian Shade (ODEQ 2002) identified riparian treatments that increase growth and health of the riparian zone as a tool to improve shade quality.

There are six perennial streams with prescribed thinning and fuels treatment in the riparian zone. Blue Creek, Logan Cut, Rock Creek, and Fry Gulch are not listed on the DEQ 303(d) list for water temperature; however, they flow into the West Fork Illinois which is listed as water quality limited due to stream temperatures. Elk Creek, planned for limited fuel reduction activity, is on the 303(d) list.

Treatments would occur in two vegetation types – Douglas-fir/tanoak and the Jeffrey Pine/white oak plant series. Each has a no activity buffer of 50' and 25', respectively. Thinning and fuel reduction treatments were designed to retain primary shade trees. The period of greatest solar radiation occurs between 10:00AM and 2:00PM hours. During this four-hour period, 58% of the total daily solar radiation is available. Thus, vegetation that intercepts solar radiation during this time is critical in producing effective stream shade and reducing stream temperature. Trees located in the primary shade zone provide shade all day and are the only trees in the riparian area that provide shade during the critical period from 10:00AM and 2:00PM. The primary shade zone in the project area is 20-50', measured from the bankfull channel perpendicular to the stream. The primary shade zone decreases with increased vegetation density and/or decreased channel width.

Logan cut and Blue Creek lie in the Douglas-fir/tanoak series. Stands identified for thinning treatments have a >80% canopy closure (CC). Under natural disturbance regime of fire and no harvest, typical historic stocking densities for this plant series range from 50-60% CC. A 50' no treatment zone would maintain primary shade. Thinning in the riparian zone outside 50' would reduce CC to 50%. Within 10 years CC would increase to 60%.

Thinning in the secondary shade zone has been found to have no effect on temperature or relative humidity microclimate when stands were thinned down to 50% canopy cover (Emmingham et al. 2002). The Sufficiency Analysis for Stream Temperatures (USDA, USDI 2003) provides guidance that vegetation treatments not reduce CC below 50%.

West Fork Illinois, Fry Gulch, Elk Creek, and Rock Creek lie in the Jeffrey Pine/white oak plant series. This plant series has a naturally low canopy closure (20 -35%). A 25' no treatment zone would be maintained. Treatments in the plant series would not decrease overstory canopy closure. Rather, fuel reduction treatments focus on removal of understory brush which affords no shade to the stream. Small (<6-12 in.) diameter trees may also be removed from the riparian zone but trees providing shade would be excluded from prescription. Prescribed fire would also occur in the riparian areas. The prescribed fire would be low intensity designed to create a mosaic vegetation pattern; a reduction in shade would not result from underburning.

POC sanitation is proposed along FS road 4402 where it intersects the riparian area of the West Fork Illinois. Approximately 11 trees would be removed along West Fork, about half located on the north bank. Loss of individual trees responsible for shade would be dispersed along a ½ mile of stream. As a result, very site specific locales may have a reduction in shade but cumulative shade along the reach of stream would be maintained. Therefore, water temperatures would also be maintained. On one perennial stream, POC treatments may result in a 75% shade reduction on a 200' stream segment. The stream has a very low channel width (5') and moderate gradient. A narrow channel width and moderate gradient partially mitigates for shade reduction. Minimal surface water area is present for heating and higher velocities reduce residence time through the reach. Additionally, the tributary represents less than 5% of the West Fork Illinois River; hence, heat loading to the WF Illinois is minimal and would not result in a measurable increase in water temperature.

3. Alternative 3

There are fewer acres of treatment proposed in Alternative 3 than under Alternative 2 (242 fewer acres of proposed harvest, 1,024 fewer acres of wildlife habitat restoration, and 257 fewer acres of fuel hazard reduction). No riparian acres would be treated except those associated with roadside POC sanitation. Based on the discussion and reasoning presented under Alternative 2, there would be no adverse effects to soil and water as a result of implementing Alternative 3. Riparian condition and trends would continue.

There would, however, been an opportunity loss. Not only a loss to improve riparian vigor and resiliency leading to improved future shade and large wood recruitment but also to protect key resources from wildfire.

### 3.2.2. Resource: Fisheries / Aquatic

a. Affected Environment

The project area includes four subwatersheds in West Fork Illinois River watershed (See Maps 5a & b, Appendix A. Whiskey Creek and the upper section of the West Fork Illinois River are the major project area streams within the Upper West Fork Illinois subwatershed. Rock Creek, Fry Gulch, and the middle section of the West Fork Illinois River are the major project area streams within the Middle West Fork Illinois subwatershed. Logan Cut is the major project area stream within the Lower West Fork Illinois subwatershed. Dwight, Blue, and Elk Creeks are the major project area streams within the Elk Creek subwatershed. Fish species that inhabit these streams include chinook salmon (*Oncorhynchus tshawystcha)*, coho salmon (*O. kisutch)*, winter steelhead (*O. mykiss)*, cutthroat trout (*O. clarki)*, Pacific lamprey (*Lampetra tridentata),* and sculpins (*Cottus spp.)*. Southern Oregon/Northern California (SONC) coho salmon are federally listed as threatened. Pacific lamprey is

a Bureau tracking species in Oregon. The Klamath Mountain Province Steelhead was reviewed for possible ESA listing (March 2001) but listing was determined to be not warranted.

West Fork Illinois River is an important fish-bearing tributary to the Illinois River although fish production is lower than than it was historically. The aquatic system has been substantially altered by excessive water withdrawal, channelization, overgrazing, removal of riparian vegetation, gravel removal and mining operations. Six water diversions were found on the mainstem in a stream survey completed by ODFW in 1994.

The upper extent of chinook use on West Fork Illinois is at the confluence with Elk Creek. Coho distribution ends just upstream of the BLM Road 41-9-9 bridge crossing. Steelhead use continues upstream into Del Norte County, California for 0.25 mile. Cutthroat and resident rainbow trout inhabit another 0.25 mile of West Fork Illinois upstream of steelhead use. The low gradient and a lack of any physical migration barriers allow anadromous fish to extend high in the watershed. A tributary located in Section 3 which flows into the West Fork immediately upstream of the Elk Creek confluence supports steelhead and cutthroat trout in the downstream 0.5 mile.

The average stream gradient of the lower reaches of West Fork Illinois is 0.5%. In the upper reaches on BLM in Section 9, a gradient of 6% is more typical. There are very low amounts of instream wood present, with almost no key pieces (>24" diameter and >50' or twice bank full width long). Sedimentation is at undesirable levels (ODFW Benchmarks and terminology are used herein and categorize habitat conditions as undesireable, adequate or desirable.) with 29% of the riffle substrate composed of fine sediments. The proportion of actively eroding banks is high, ranging from 20 to 55%. Canopy closure in the riparian zone is poor, ranging from 16 to 50%. The West Fork is 303(d) listed for summer temperatures, as the seven-day average maximum stream temperature has exceeded the DEQ standard of 64°F. Pool frequency, as measured by number of channel widths between pools, is at desired levels, ranging from 3.2 to 6.1 channel widths per pool. Average residual pool depth is approximately 1.0 meter, which is adequate, with a range of 0.7 to 1.4 meters. Cool water temperatures, mild stream gradients, woody material and suitable spawning habitat, which are found in the upper reaches, provide the highest quality of habitat in the system.

The benthic invertebrate community was assessed on West Fork Illinois immediately downstream of the Whiskey Creek confluence. Very low quality erosional, margin and detritus habitat for benthic invertebrates was found. The study found that disturbance to substrate is high, and that habitat complexity and retention mechanisms are far from optimal. The absence of cold water invertebrate biota indicates that water temperatures are non-supportive of salmonids. The limiting factors include: warm summer water temperatures, flashy systems with high levels of disturbance, an open channel with high solar exposure, and very low recruitment of deciduous detritus.

An unnamed perennial tributary upstream of the Whiskey Creek confluence in Section 9 supports cutthroat trout for several hundred feet downstream of the FS Road 4402 crossing. Fish habitat decreases 150' upstream of the road crossing. The gradient is 10% with adequate pools, large woody debris (LWD) and gravel content.

Whiskey Creek is a perennial fish-bearing tributary to West Fork Illinois River. Winter steelhead are present 1.0 mile upstream of the confluence. Resident trout and cutthroat are present 2.3 miles upstream of the confluence with West Fork. Boulders form pools and riffles with pockets in the channel. The instream woody debris level is undesirable as practically no wood is found in the lowest

reach. Substantial scouring occurs frequently, and sediment levels in the spawning gravels are adequate. Canopy closure is at an undesirable level, perhaps naturally, at less than 40%. Pool frequency is desirable in the lower reaches, where the creek is similar to West Fork at its confluence with Whiskey Creek. Average residual pool depth in the lower reaches is adequate (<1.0 meter). The average gradient is 0.5%.

Elk Creek is a perennial fish-bearing stream that flows into West Fork Illinois. Chinook, coho, steelhead and cutthroat are present for 3.5 miles upstream of the mouth. Coho, steelhead, and cutthroat use extends upstream out of the project area and for several miles into California. The average gradient in the lower reaches is 0.4-1.7%. The gradient increases to 11.8% beginning in Section 12, over the California border. The lower reaches are dominated by scour pool habitat and are rated poor by ODFW's benchmarks for LWD volume. The upper section is dominated by cascades and rapids and has an excellent volume of LWD. The width to depth ratio is poor, except in the upper reach where it is fair. The silt, sand and organic content in the riffles was rated good.

Blue Creek is a perennial fish-bearing stream which flows into Elk Creek. Winter steelhead and cutthroat trout are found upstream from the confluence for a distance of 1.5 miles to the point where a 60' waterfall creates a fish passage barrier. The average gradient of Blue Creek is 7 % in the lower reaches and 11% in the upper reaches. Instream wood is at an undesirably low level based on ODFW's benchmark standards. Sediment within the spawning gravels is at adequate levels. Canopy closure over the stream is at desirable levels (>75%). Pool frequency and average residual depth is at undesirable levels most likely due to scouring to bedrock and the lack of instream woody debris. Approximately 10% of the streambanks in Blue Creek are actively eroding.

An unnamed perennial tributary to Blue Creek flows through BLM land in Section 10 and supports cutthroat trout in the downstream 0.5 mile. The average gradient is 10-15%. Due to the size of the creek, small diameter wood is functioning as LWD.

Dwight Creek, a tributary to Elk Creek, is perennial and contains chinook, coho and steelhead in the downstream 0.5 miles. Cutthroat trout use extends for 1 mile from the mouth. The perennial tributary flowing from BLM in the northwestern corner does not contain fish habitat.

Rock Creek, a tributary to West Fork Illinois River, is an interrupted perennial stream that flows subsurface in the summer. It flows approximately 0.5 miles through the project area to the confluence with the West Fork. Fish use is unrecorded in the creek. The channel is boulder dominated, with a gradient of 3-8% through the project area. Large instream wood is at inadequate levels, and stream shade is sparse. The few scattered Port Orford cedars provide little canopy cover and the channel is wide and braided for half of the length within the project area.

Fry Gulch Creek is a tributary to West Fork Illinois River. Approximately half of the stream length within the project area is intermittent. Downstream of a permanent pond which contains warmwater fish species, the stream has perennial flow which supports fish use during wet periods. Sunfish species have been found in adjacent isolated ephemeral ponds. Fish habitat is poor to non-existent downstream of the permanent pond. Approximately 0.5 miles downstream and outside of the project area, anadromous fish presence was recorded. The Fry Gulch area was mined hydraulically and the creek channel and surrounding area are degraded due to this disturbance. Stream gradient through the project area is 2-4%. The channel is void of instream wood and pool structure.

Logan Cut is a perennial, fish bearing tributary to West Fork Illinois River. Logan Cut is an historic mining diversion ditch that was constructed to convey water from the East Fork Illinois River watershed to the West Fork watershed. Coho are present approximately 1.0 mile upstream from the connection to the West Fork; use by other species is unrecorded. The average stream gradient is 7.0 %. Instream wood levels are below desirable levels. There is a high amount of sediment present throughout the stream, and 50% of the streambanks are actively eroding. Canopy closure over the stream is at desirable levels (75%). Pool frequency is low and average residual pool depth is shallow, likely as a result of the scarcity of instream woody debris large enough to contribute to pool formation in the remnant trapezoidal channel.

b. Environmental consequences

1) Alternative 1: No Action

a) Short term (< 10 years)

Input of sediment from road runoff to creeks within the project area is not expected to change from its current low levels. The impact to fish of from road runoff is currently minimal (very little, limited to few sites). Currently, sedimentation within the project area is primarily due to the lack of riparian vegetation on private land, channelization, and consequent stream bank erosion.

The current vegetation trends would continue and, in the short term, there would be little change of the fisheries conditions. While the seral stages in the riparian reserves would continue to advance, the size and amount of wood added to the stream would negligibly increase in the short term. Old logging roads and trails in the riparian areas which are compacted and not yet revegetated would remain in an unrecovered state. Salmonid production and survival would continue to be limited by lack of large woody debris, the associated low stream complexity, and high summer water temperatures.

b) Long term (10+ years)

The long term impact to creeks within the project area from input of sediment from road runoff would be the same as for short term impacts: minimal (i.e., very little, limited to few sites).

As the seral stages in the riparian reserve continue to advance, the size and amount of wood added to the stream would increase in the long term (50-100+ years). This would result in increased pool frequency and depth, improved stream complexity, and an increase in rearing habitat quality. There would be increased canopy cover and stream shading. Riparian logging roads and trails within recovering stands would begin to decompact and revegetate reducing potential runoff and erosion. This in turn would contribute to increased salmonid production and survival by improving riparian structure, decreasing summer water temperatures and increasing stream habitat complexity. The cumulative benefit contribution would be slight at the 6th and 5th field watershed levels due to differences in private land ownership objectives and management practices.

2) Alternatives 2 and 3: Proposed Action

a) Short term (< 10 years)

*Road Work* - Proposed road work is the same in both action alternatives. Approximately 1.0 mile of

new road construction is proposed. Road construction would occur on ridge tops away from stream corridors. Approximately 3.9 miles of road renovation is proposed. The proposed road upgrades would improve hydrologic function through outsloping, blading, water dipping, installing culverts, spot rocking, etc. Approximately 19.9 miles of road maintenance is proposed, involving blading, drainage repair, and spot rocking. New skid trails will be restricted to designated routes. Following use, the skid trails will be water barred, closed, or mulched with native seed, reducing water concentration and routing. In Section 9, the two existing log culverts will be replaced with CMPs during the driest period, when flows can be routed around the work area. In Sections 28 and 33, stream crossings will be improved by installing temporary and permanent culverts and placing rock during the dry season when flows are minimal and fish are not present.

In Alternative 2, existing skid trails that are used within the Riparian Reserves will be decompacted following use. In Alternative 3, no skid trails will be used within the Riparian Reserves, and none will be decompacted.

It is anticipated that the short term beneficial effects from road maintenance and renovation will maintain downstream salmon survival and production. Short term beneficial effects from road activities include sediment reduction, improving road conditions for peak runoff flows, and better water drainage.

The use and subsequent decommissioning of pre-existing but unrecovered skid roads and landings in the riparian reserves under Alternative 2 will provide a short term benefit for aquatic resources by reducing sediment delivery and re-establishing canopy cover on riparian roads.

Minimal, insignificant, short term pulses of sediment may occur from road maintenance and renovation, but are not likely to negatively affect fish or fish habitat due to the implementation of Project Design Features and District Best Management Practices (BMPs). The amount of sediment delivery would be so small as to not cause an increase in streambed embeddedness, an increase of fines in the gravel, or turbid water. Road maintenance and/or renovation will have negligible affects to salmonid migration, spawning, egg incubation, rearing, and feeding. Sediment delivery associated with road maintenance and renovation will not cause degradation or modifications to fish habitat.

The operator spur roads to be constructed and decommissioned are short and discontinuous in nature. They are located on stable ridge tops and midslopes and will not affect floodplain connectivity. Road density will not be increased, because the roads will be decommissioned following use.

There is minimal potential for impacts to riparian and stream habitats, and hydrologic function as a result of the proposed road activities. Any impacts would be negligible at the sixth field level. Any sediment delivery would be short-term and minimal in quantity and will not be likely to degrade habitat or to negatively affect salmonids' life history requirements such as migration, spawning, egg incubation, rearing and feeding.

*Vegetation Treatments - F*uels reduction treatments would take place adjacent to a stream containing fish or fish habitat in T41S,R9W, Sec10 on Blue Creek and in T40S,R8W, Sec 9 along Logan Cut. Wildlife habitat restoration treatments would take place on large blocks of land adjacent to fish habitat on upper West Fork Illinois in T41S,R9W, Sec 9, along the West Fork Illinois, Elk Creek, and Rock Creek in T41S,R9W, Sec 3, and along Fry Gulch in T40S,R8W, Sec 28. Perennial and intermittent streams without fish habitat in these areas would be adjacent to large treatment areas as well.

Mechanical treatments and prescribed burning within Riparian Reserves would be restricted to areas outside of no treatment zones which are based on the plant series present, the flow of the stream, and whether fish and/or fish habitat are present.

Small woody material would be consumed during prescribed burning, but large coarse woody material would be left largely intact. During underburns in riparian areas, higher fuel moisture and relative humidity combine to slow the movement of fire, reducing the risk of mortality of large trees and consumption of snags and large down wood. The low intensity fires have a very low risk of resulting in the mortality of large overstory trees. The future recruitment of large woody debris and shade would not be adversely affected by the application of prescribed fire in the riparian reserve. The future recruitment of large woody debris would not be reduced, therefore having little or no effect on future instream habitat conditions or present shade cover. Sediment and ash are unlikely to be transported to fish habitat because of the unburned strip of vegetation and organics that would be present in no treatment zones along streams. The exception would be in the Jeffrey Pine and White Oak plant series, where intermittent streams without fish would be treated up to the channel. Even in these cases, the objective of backing fire into the riparian is to create a mosaic pattern of burning. Since the burning of organics on these streams would be neither intense nor continuous, it is unlikely that more than negligible amounts of sediment would be transported to fish habitat. The timing and duration of any sediment transport resulting from these burns would coincide with high winter flows and would not be likely to adversely affect fish or fish habitat.

There are proposed harvest units adjacent to fish or fish habitat in T41S,R9W, Sec10 on 0.2 miles of Blue Creek and in T40S, R8W, Sec 9 along 0.5 miles of Logan Cut. Other units proposed for timber harvest range from 0.1 miles to 1.5 miles from fish or fish habitat. Intermittent streams, ephemeral draws and ephemeral draws flowing into intermittent streams drain from these units. Vegetation treatment prescriptions within the Riparian Reserve were developed to meet objectives for ecosystem function that tier to the NFP's ACS. PDFs establish restrictions for the implementation of the prescriptions in these areas that would minimize the potential to negatively affect fish and aquatic habitat. Tractors would operate in riparian areas that have slopes less than 35%, and logs would be lined to existing or designated skid trails, which would be decompacted following use. Silvicultural treatments in Riparian Reserves would not reduce the canopy coverage below 50%, with the overall long term target of greater than or equal to 60%. Vegetation primarily responsible for providing shade to the active channel would be retained. Snag, down wood, and instream large woody debris retention and recruitment would be provided for prior to removal of timber from the Riparian Reserves.

Potential effects to streams from thinning within the Riparian Reserve are anticipated to be highly localized, unmeasurable, negligible, and short term at the project level ($6^{th}$ and $7^{th}$ field scales) and 5th field scale. The amount, timing and duration of any sediment delivery would be so small and of short duration that it would not kill aquatic insects used as food and would not embed spawning gravels effecting the eggs and alevins. Any turbidity would be within the range of natural variability for the streams in the project area. Further, the sediment would be delivered during winter run-off periods when flows are higher, thereby reducing the likelihood of adverse effects to fish. Retention of shade on perennial streams will prevent stream temperature increases. It is anticipated that the beneficial effects will maintain downstream salmon production and survival. The effects to fish or fish habitat are not likely to be adverse because of the efforts to eliminate sediment delivery mechanisms and disturbance through PDF.

In Alternative 2, approximately 896 acres could be treated for fuel reduction using a slashbuster. The

only units where these treatments would be adjacent to streams with fish would be those along Fry Gulch and Logan Cut (approx. 40 acres). Approximately 223 acres could be within riparian reserves of streams without fish. There are no slashbuster treatments proposed in riparian reserves in Alternative 3.

Effects from slashbuster and subsequent underburning would be highly localized, unmeasurable, negligible, and have short term impacts. Stream bank stability would be maintained because the tracks of the slashbuster would be restricted from entering the no treatment zone along the channel. Based on monitoring of previous slashbuster treatments, because the tracks are riding on an 1-4" layer of shredded /chopped vegetation and have a low ground pressure, only 2 - 4% of the project area would be likely to have signs of soil compaction. Potential for sediment routing to streams would be low due to the presence of a shredded vegetation layer and the untreated strip next to streams. Stream crossings would be designated where the channel is naturally armored and banks are low to minimize the potential for erosion.

b) Long term (>10 years)

*Road Work* - It is anticipated that the long term beneficial effects from road maintenance, renovation, and/or decommissioning will maintain downstream salmon survival and production. During road renovation, cross drain culverts may be replaced and sized according to 100-year flood criteria. Decommissioning spur roads will increase infiltration and decrease overland flows and in the riparian reserve allow the reestablishment of riparian vegetation. Long term beneficial effects from road activities include sediment reduction, improving road conditions for peak runoff flows, and better water drainage. The reduction in sediment delivery will aid egg and juvenile fish survival because the risk of egg suffocation will be lower. The risk of direct or latent mortality to juvenile fish from sediment delivery is less than with the no action alternative. The use and subsequent decompacting pre-existing but unrecovered skid roads and landings in the riparian reserve will provide a long term benefit for aquatic resources by reducing sediment delivery and re-establishing canopy cover on riparian roads.

In conclusion, no long term adverse affects to fish are anticipated. The proposed road work will have short term effects but will not have a long term negative impact on water quality (temperature, sediment), channel condition and dynamics (floodplain conductivity, stream bank condition), flow/hydrology (peak/base flows, drainage network increase), watershed condition (road density and location, riparian reserve function).

*Vegetation Treatments* - *P*otential adverse effects are limited to the short term scale, that is, highly localized, negligible, short term impacts at the project level ($6^{th}$ and $7^{th}$ field scales) and 5th field scale. The proposed action includes thinning in the riparian reserves to accelerate the development of late-successional forest conditions. Late-successional forest conditions in the riparian reserves would be characterized by increased structural diversity, canopy, and large woody debris recruitment, with improved stream complexity and water quality. Salmon production would be likely to increase as improved channel function results in increased adult holding areas and improved gravel retention. Sediment reduction in spawning gravels and improved water quality would increase egg survival. Improved rearing habitat resulting from lower summer water temperatures and increased pool quality would increase the probability for juvenile survival.

It is anticipated that the long term beneficial effects will maintain downstream salmon production and

survival.

c) Cumulative effects

*Road Work* - No cumulative adverse affects from the proposed road work are anticipated due to the low average road density in the watershed and the small percentage of the watershed involved in the proposed action (See Section 3.2.1). The production and survival of salmonids will be maintained.

Earth movement associated with suppression efforts on the Biscuit Fire along Whiskey Creek together with the proposed action were analyzed for potential cumulative effects. No cumulative effects are anticipated from the operator spur road construction and decommissioning in Sections 12 and 13 due to the ridge top location and the absence of sediment delivery mechanisms. Short term sediment inputs associated with the proposed road maintenance and renovation combined with fire suppression activities such as fire line construction and burnout should not result in a cumulative negative impact due to the timing, duration and widely dispersed nature of potential sediment sources.

*Vegetation Treatments* - The cumulative direct and indirect adverse effects are minimal or negligible in these alternatives because of the efforts to eliminate sediment delivery mechanisms and disturbance through PDF. The West Fork Illinois River watershed's poor riparian structure, inadequate large woody debris, elevated summer water temperatures, sedimentation, and irrigation withdrawals have contributed to a decline in salmon populations. The adverse impacts of actions outside federal lands are likely to contribute to the decline toward degraded habitat due to increasing summer water temperatures, increasing sedimentation, reduced riparian condition, and diminished stream complexity. However, if the proposed actions are taken, riparian areas on federal land will have the opportunity for currently degraded or at-risk habitat conditions to move toward recovery. This is true to a lesser extent in Alternative 3 because no vegetation treatments would be done in the Riparian Reserves except POC sanitation and planting, and road maintenance and renovation.

Adverse effects of the Biscuit Fire to the West Fork Illinois River Watershed are not currently known. It is unlikely that any potential negative effects of the proposed vegetation treatments will increase the potential adverse effects of the fire on the watershed scale as the proposed actions will be dispersed, discontinuous, and localized.

In conclusion, based on this analysis of potential impacts, we have determined that the effects of the proposed actions would not likely disrupt normal behavior patterns such as migration, spawning, egg incubation, rearing and feeding. Significant modifications or degradations of habitat would not occur. The habitat would be expected to improve as late-successional forest develops in the riparian reserves.

### 3.2.3. Resource: Vegetation

a. Affected Environment

There are seven major plant series in the West Fork Illinois River Watershed: Douglas-fir, Jeffrey Pine, Tanoak, White Oak, Ponderosa Pine, Port-Orford Cedar (POC) and Western White Pine. All but the ponderosa pine series occurs in the project area. The POC series is not formally mapped but is found in stream channels, lower slope positions, or other high humidity areas. Portions of the POC community within the project area are infected with root disease. The proposed actions will primarily

affect the Jeffrey Pine, Tanoak, and Douglas-fir plant communities and to a much lesser extent the Western White Pine and White Oak communities.

White oak and western white pine communities are of limited extent within the project area. They are declining due to conifer encroachment, and excessive fuel loadings/ladder fuels due to fire exclusion. The western white pine community is found in T41S, R9W, Section 9 along the West Fork of the Illinois River, which is the area proposed for RNA designation. Threats to this community include white pine blister rust, dwarf-mistletoe and, as mentioned, the consequences of fire exclusion.

Jeffrey pine is the most common plant series on BLM lands in the West Fork Illinois River Watershed (Table 3-4). When influenced by high frequency, low intensity natural fire, these stands typically form a simple structure best characterized as "savannah". The overstory is sparse, with cover averaging 23%, and is dominated by Jeffrey pine with the occasional Douglas-fir or incense cedar (Atzet 1996). Typically, the understory is dominated by low shrubs and grasses, except in areas where shrubs dominate due to fire exclusion. The average fire return interval for this plant series is 14 years (Atzet 1999).

Productivity is low on the Jeffrey pine series, with stunted trees rarely attaining diameters greater than 15" or heights more than 40'. This is due to the low productivity ultramafic soils (serpentine / peridotite). High concentrations of magnesium and iron within these soils create high levels of toxicity for most plants. On ultramafic sites the primary natural disturbance processes are fire and wind, and the primary human influences were/are historic mining and road building. The lack of frequent fires in the Jeffrey pine series has allowed for higher shrub cover, establishment of Douglas-fir and incense cedar, and higher stocking levels of Jeffrey pine. The increased shrub cover competes with the overstory for soil moisture, further reducing individual tree vigor. The shrubs also compete with native grasses and forbs, effectively shading them out.

Douglas-fir is the second most common plant series (Table 3-4). In this series Douglas-fir is the dominant species (often > 80% of a stands' composition). Ponderosa and sugar pine are best represented in the overstory, with very little regeneration occurring in the understory. Conifer regeneration occurs in gaps created by overstory mortality and is primarily Douglas-fir at this time. Understory hardwoods include Pacific madrone, black oak and tanoak. Tanoak is often successful at regenerating under the canopy resulting in a dense understory of tanoak seedlings/saplings. Overstory canopy closure averages 71% (Atzet 1996).

The Douglas-fir plant series is fairly productive, capable of supporting an average of 254 $ft^2$ basal area/acre (Atzet and Wheeler 1984). Fire is a significant component of this plant series, with the average fire return interval estimated at 15 years (Atzet 1999). This created a multi-aged stand structure supporting a diversity of tree sizes and species composition. In the absence of fire, stands in this plant series now support more trees/acre with a less diverse canopy structure. Crowns from the post-fire exclusion cohort are competing directly with the crowns of the remnant old-growth trees. This not only reduces the vigor of the old-growth trees but also allows fire to climb into the overstory, resulting in stand replacement fire. The high productivity produces high duff/litter depths, shrub abundance, and regeneration is abundant. This translates into higher fuel loading and more ladder fuels which are conditions considered to be outside the natural range of variability.

Species composition in the tanoak series is similar to the Douglas-fir series, except tanoak abundance is great enough to be called the climax species (Atzet 1996). There is a distinct structure difference between aspects within this plant series. North slopes are the most productive with a closed-canopy of Douglas-fir and the understory is dominated by large tanoaks. On south and west-facing slopes, there are scattered conifers with large tanoak forming a dense canopy underneath. The overstory species include Douglas-fir, sugar pine and ponderosa pine with an average canopy closure of 85% (Jimerson 1996). Tanoak is the dominant hardwood, followed by madrone and black oak. The average fire return interval is 18 years (Agee 1993).

Productivity is the highest in the tanoak series, supporting as much as 262 $ft^2$ basal area/acre (Atzet and Wheeler 1984). Because productivity is high, concerns for this series are very similar to those discussed for the Douglas-fir series. In addition to the fuels build-up, tanoak abundance is much greater and has significantly lowered conifer regeneration rates and even excluded them in some areas.

**Table 3-4: Major Plant Series on BLM Lands in the West Fork Illinois River Watershed**

| Plant Series | BLM | | Non-federal | |
|---|---|---|---|---|
| | Acres | % | Acres | % |
| Jeffrey Pine | 3,047 | 53% | 2,290 | 14% |
| Douglas-fir | 1,808 | 32% | 6,166 | 38% |
| Tanoak | 479 | 9% | 4,252 | 26% |
| Non-Vegetated, Non-forest, or Grass | 150 | 3% | 3,557 | 22% |
| White Oak | 65 | 1% | 128 | 1% |
| Ponderosa Pine | 63 | 1% | 62 | 0% |
| Unknown Series - Riparian Hardwood | 32 | 1% | 0 | 0% |
| Totals | 5,644 | 100% | 16,455 | 100% |

*Source: (USDI 2003).* Plant series acres for Forest Service lands are not available

During the summer of 2002, approximately 22,000 acres of the watershed burned in the Biscuit Fire. The fire created 14,800 acres of early seral vegetation and another 6,200 acres of patchy mortality to the overstory. The remaining 1,000 showed little or no change to the overstory. This fire occurred primarily on Forest Service lands within the watershed.

Based upon the analysis is the Port-Orford-Cedar Risk Key , all POC on both Federal and Private lands in the project area that are on ultramafic soils are considered "measurably contributing to land and resource management plan objectives". The appropriate management practices for mitigation of impacts will be applied to these areas. On BLM lands within the project area on non-ultramafic soils, there are no POC within or near the operations that measurably contribute to land and resource management plan objectives. However, there are POC located on private lands along ingress and egress routes which are infested. The risk key as applied to these areas means that management practices for mitigation are not required, but in order to mitigate potential spread due to project activities, equipment washing and dry season operations will occur as described in the proposed action.

b. Environmental Consequences

1) Alternative 1 (No Action)

a) Short and long term

Within the project area fire exclusion has created conditions favorable to Douglas-fir establishment,

resulting in abnormally high stocking densities. Once established, these trees develop into the stem exclusion phase. During the stem exclusion phase, understory vegetation is shaded out, crowns recede, height growth is enhanced, and suppression-induced mortality begins in the smaller tree classes. Stands at high densities reach the stem exclusion phase faster than low density stands. Also, natural fire would play a role in keeping stand densities lower, resulting in more open grown stands. Stands remain in the stem exclusion phase until mortality to the overstory creates canopy openings and structural complexity begins to develop. Therefore, structural complexity will eventually be attained through insect and disease attack, windthrow, and tree decadence but only if major stand replacement events do not occur.

Lack of disturbance in fire-adapted systems, such as those found in the project area, results in higher stocking densities than the site is capable of maintaining. This results in low-tree vigor, reduced understory vegetation, high fuel loadings from suppression-induced mortality and litter fall, and higher levels of insect and disease infestations/infections. These conditions are considered outside the range of natural variability for the Douglas-fir and Tanoak plant series. Once outside the natural range of natural variability, ecosystem stability, biological diversity, resilience and ecosystem health is reduced (Atzet and Martin 1991). The no-action alternative allows stands to remain outside the natural range of variability.

In the no-action alternative, abundance of early seral species such as pine and black oak will be reduced because of lack of regeneration opportunities and large tree mortality. Regeneration of these ecosystem components will continue to be limited by lack of canopy gaps (light to the forest floor) and high duff/litter layers. The longevity of large pre-fire exclusion pines and black oaks will be shortened by competition from post-fire exclusion cohorts. Thus, stand diversity in terms of species abundance and vertical structure is reduced with the no-action alternative.

The Jeffrey pine series is a steady state community that outwardly resembles early and mid-seral stand structures if fire is allowed to play a role. This series is an exception to the traditional stand development model because recruitment of new trees is continuous, canopy closure is low and large trees are rare. The major impact of no-action to this community is shrub decadence, reduction of native grass and forb abundance/diversity, and reduction of overstory tree vigor from higher stocking levels.

b) Cumulative Effects

Annual insect surveys of Southwest Oregon indicate a recent increase in insect activity. As these populations build, the potential for insects to move into the project area increases. Maintaining stands outside the natural range of variability allows for an increase in insect and disease abundance. If insect populations are allowed to build-up on BLM lands within the project area, the potential for these to spread to adjacent lands increases. During endemic periods of insect infestation, only trees of low vigor are typically attacked, but once epidemic population levels are reached even healthy trees are subject to attack.

The high fuel loadings and ladder fuels created by the successful exclusion of fire has created prime conditions for a wildfire start on BLM to spread to adjacent private/public lands. Stand replacement fire within the watershed will reduce structural complexity, create early-seral conditions, and increase

brush abundance.

Wood demand and the need for products to supply this demand are not influenced by the quantity or quality of products taken from public lands. Consumers are responsible for this demand and if wood demand is not met through sustainable forest practices, it will be met in areas not subject to these sustainable practices. Mitigation measures taken on public lands far exceed those taken on other lands; therefore, negative cumulative effects from deferral of harvest on public land are increased by meeting this demand on other lands.

Under the no-action alternative, infected POC will not be removed near the FS4402 road, allowing the potential for root disease spread to continue. Also, no planting of resistant seedlings will occur and abundance of this species will decline within infection areas. Hauling past POC trees on private lands will not occur, lessening the potential for root disease spread to other areas. The potential for spread will remain however, because private access on these lands will continue at the current rate. Disease spread is more likely to occur from private individuals because they operate equipment/vehicles throughout the year without frequent washing/removal of infested soil.

2) Alternative 2

a) Short and long term

Overall tree densities in the treated stands will be reduced, resulting in more available resources for the residual stand. Crown recession will cease, and new foliage will be produced to respond to increased light. This subsequent increase in photosynthetic productivity increases individual tree vigor. Stands with high tree vigor are less susceptible to insects and diseases. Removal of competing vegetation around large hardwoods and conifers will increase their vigor and restore a multi-layered stand structure. Increased light to the forest floor coupled with underburning which can expose some bare mineral soil will promote regeneration of shade-intolerant tree species, such as pines. Immediately following harvest, average stand diameter will be higher because most of the stems/acre removed are from the smaller diameter classes. Over the long-term, average stand diameter will be substantially higher than in the no-treatment alternative as residual trees respond vigorously to the open growing conditions. Introducing stand variability, protecting against stand replacement events, and growing large trees faster will accelerate the attainment of mature forest stand structure.

In the Jeffrey pine series, proposed treatments include prescribed burning, hand cutting and mechanical mastication of excess brush and small diameter trees. Individual tree vigor will be improved, mortality from insects and disease will be lessened and higher growth rates will raise the average stand diameter. Prescribed burning is expected to reduce shrub dominance and allow forb and grass cover to increase. Plant diversity and vigor will be higher within 5 years of treatment than currently exists or than would exist under the no action alternative.

Roadside sanitation of POC will reduce the spread of infection to uninfected areas. Inoculum reduction occurs within 1 year of sanitation with substantial declines observed 3 years or more after treatments (up to a 60% reduction has been observed)(Marshall and Goheen 1999). Prescribed fire within the infected areas will help reduce inoculum levels, especially if coupled with sanitation. The proposed gate in T41S,R9W, Section 9 will help prevent new infection from entering streams

containing POC. Planting of resistant seedlings will introduce resistance into the POC population and over the long-term will retain this species as an ecosystem component.

No harvest will occur within stands in the project area that contain POC. Hauling may occur through private lands in T41S, R9W, Sec. 10 & 11 where POC is located near the haul roads. Project design features for hauling along these roads include operating in the dry season and washing equipment prior to and after operating in these areas. Washing has shown to reduce viable inoculum by 92% on a road grader, 91% on a pickup truck and 96% on a worker's boots (Goheen et al. 2000). Optimal temperatures for infection are between 50 and 68º F and infection requires the presence of water around POC roots for at least several hours (Trione 1974; Goheen et al. 1999; Hansen et al. 2000). Given these requirements, potential for spread during dry season operations is extremely limited. Once equipment leaves the aforementioned sections the haul route is along paved roads, further limiting the potential for spread.

b) Cumulative Effects

Accelerating the development of mature conditions will result in a lower degree of fragmentation of this seral stage within the project area. The reduction of stand densities combined with associated fuel treatments will lower the probability of a fire start on BLM land spreading onto adjacent lands. Insect populations will be less abundant, as trees with high vigor ward off attack, reducing the possibility of an epidemic insect outbreak.

Within the last 5 years, commercial harvest on BLM lands has occurred on approximately 173 acres in two timber sales, 3 + 3 and Noreast. Commercial harvest has also occurred on private forest lands some within the last the last 5 years. The Rough and Ready lands transferred ownership to Perpetua recently, which has plans to harvest 100 acres/year for the next three years. The addition of 684 acres, under this proposed action, of commercial harvest within the West Fork Illinois River Watershed (76,932 acres) to these previous and future harvest activities equates to about 1.1% of the watershed being impacted by harvest activities.

3) Alternative 3

a) Short and long term

The proposed actions in this alternative are the same as those proposed under alternative 2, except fewer acres will be treated. Therefore the effects are very similar to those previously discussed, except in scale.

### 3.2.4. Resource: Botany

a. Affected Environment

The project area encompasses some popular wildflower viewing areas including a portion of the historic Waldo town site and the Whiskey Creek fen on the historic Wimer road. Both areas are considered type localities (the point of scientific discovery) for numerous serpentine endemic species. The affected environment on BLM land is a diverse mosaic of dry, low elevation Douglas-fir and

tanoak forests interspersed with some small white oak woodlands, ephemeral wetlands, serpentine wetlands, serpentine savannah and serpentine shrublands. Unique plant communities not common to BLM land in the Illinois Valley occur such as western white pine-Jeffrey pine/huckleberry oak/beargrass or western white pine-tanoak/huckleberry oak/beargrass plant associations. Also, the riparian plant association of Port Orford Cedar-western white pine/huckleberry oak occurs. The serpentine wetlands are dominated by California pitcher plant/bog plant association.

Surveys will be completed for the project area by October 2004. The vast majority of acreage has been surveyed and based on this the following table summarizes populations found. If new species are located plants will be protected using the appropriate management recommendations.

**Table 3-5: Special Status Plants Survey Findings ***

| Species | Habitat | Protection Status | # of Populations |
|---|---|---|---|
| *Lomatium cookii* (Cook's lomatium) | Wet meadows and wet forest openings | Federally Listed Endangered | 5 |
| *Cypripedium fasciculatum (*Clustered ladyslipper) | Moist microsites in mixed evergreen forests | Bureau Assessment | 6 |
| *Epilobium oreganum (*Siskiyou willow herb) | Serpentine wetland edges | Bureau Sensitive | 1 |
| *Erythronium howellii (*Howell's fawn lily) | Serpentine forest edges | Bureau Sensitive | 28 |
| *Limnanthes gracilis var. gracilis (*Slender meadow foam) | Wet meadows and wet forest openings | Bureau Sensitive | 7 |
| *Pseudoleskeella serpentinense (*Serpentine moss) | Rocks in serpentine | Bureau Sensitive | 5 |
| *Senecio hesperius (*Siskiyou butterweed) | Dry serpentine savannah | Bureau Sensitive | 13 |
| *Viola primulifolia ssp. Occidentalis (*Western bog violet) | Serpentine wetlands | Bureau Sensitive | 3 |
| *Crumia latifolia (*Three-lined moss) | Wet rocks, cliffs, flowing streams | Bureau Assessment | 1 |
| *Carex livida (*Livid sedge) | Wetlands | Bureau Assessment | 1 |
| *Delphinium nudicaule (*Red larkspur) | Oak woodlands | Bureau Assessment | 1 |
| *Monardella purpurea (*Serpentine monardella) | Open serpentine | Bureau Assessment | 4 |
| *Salix delnortensis (*Del Norte willow) | Serpentine riparian | Bureau Assessment | 1 |

** as of March 2004*

Numerous Bureau Tracking species have been found during surveys. Bureau Tracking species are not considered Special Status and usually do not receive special management consideration. Their occurrences are tracked for conservation concerns, but they do not qualify as sensitive or assessment status. Bureau Tracking species found in the project area are *Tortula subulata, Arabis aculeolata, Cardamine nuttallii var. gemmata, Cardamine nuttallii var. dissecta, Calochortus howellii, Carex serpenticola, Cypripedium montanum, Epilobium rigidum, Hieracium bolanderi, Lewisia oppositifolia, and Microseris howellii..*

1) Vascular plants -

a) Listed Species

*Lomatium cookii* was listed federally as endangered (November 2002). Critical habitat has not been designated. The range of this species is disjunct with thirteen occurrences in the Rogue Valley and twenty five occurrences in the Illinois Valley. The Illinois Valley habitat for this species consists of alluvial silts and clays within serpentine soils. The meadows where the species is found are dominated by California oat-grass and occur with Oregon white oak-ponderosa pine/Jeffery pine savannah. An

open shrub layer of wedge-leaf ceanothus and white-leaf manzanita is interspersed with native and introduced grasses and herb. No estimates of suitable habitat for Cook's lomatium have been done for the Illinois Valley. The total population in the Illinois Valley is not known, but is estimated to be less than 250,000 plants on 150 acres of occupied habitat. Because of the small occupied acreage, scattered distribution and threats to its habitat such as development and off-highway vehicle impacts, the trend for populations is downward within the Illinois Valley (USDA / USDI 2003)).

Surveys in 1999 located a population of *L. cookii* in Section 28 east of Waldo Hill Cemetery and beside a road initially proposed for reconstruction. Surveys in May 2004 found that this population had spread into the old road. Proposed reconstruction has been dropped from the proposed action and there will be no impact to the population.

This project area is not within the range of the federally listed, *Fritillaria gentneri*. Therefore, no effects to this species will occur.

This project is within the range of the federally listed (endangered), *Arabis macdonaldiana*. This species occurs at higher elevations primarily in California on Forest Service lands (about 94 occurrences). About 11 occurrences are known from Forest Service lands in Josephine County. The species has never been confirmed on BLM land in Josephine County, including project area surveys. Therefore, no effects to this species will occur.

*Cypripedium fasciculatum* and *C. montanum* habitat is present in the project area. It is typically found where moist conditions prevail. These orchid species are very long-lived; perhaps as long as 95 years (Mgmt. Recommendations 1998). It can take up to 15 years for them to emerge above ground and they require specific mycorrhiza* for germination. Intact organic soil profiles with these fungal connections are an important habitat feature for new population establishment. These fungal connections are important not only for establishment, but also during early dormant (underground) years and potentially throughout the life cycle of these orchids. The range of *C. fasciculatum* extends from northern California north into Oregon through Washington and east into Idaho, Montana, Wyoming, Utah and Colorado. The range of *C. montanum* is found throughout California, north into Oregon, through Washington and east into Idaho, Montana, Wyoming, Utah as well as Alaska.

A recent assessment made by the Oregon Natural Heritage program has recommended that *C. fasciculatum* be moved from List 1 to List 2 for the state of Oregon due to its global ranking of 4. A global ranking of 4 means "the species is not considered rare and apparently is secure, but with cause for long-term concern, usually with more than 100 occurrences" (Oregon Natural Heritage website - Species Recommendations 2003). This will in turn lead to the recommendation that the species be moved from Bureau Sensitive to Bureau Assessment under BLM policy, which allows managers discretion on whether protection is necessary to populations. *C. montanum* has a global ranking of 5 and is not on the Bureau Special Status list anymore (it is Bureau Tracking, though).

Through most of the project area, the transition between forests and serpentine openings provide excellent edge habitat for *Erythronium howellii*. This species has a very narrow range encompassing only the southern end of the Illinois Valley and a small portion of Del Norte county in northern California. A majority of the known populations exist in the East Fork Illinois watershed on BLM land. But 28 populations were located in the project area, with some populations being quite

extensive. The populations occur in canopy closures ranging from 10 - 60%. Many of these populations are along edges or in openings, but some also extend deeper into open forested stands. This most likely is because the forest edge has expanded. Populations that were once on the edge are now under forest canopy due to the encroachment of the forest into openings. The species appears to tolerate canopy openings, but it is unknown how much ground disturbance can be tolerated.

In similar habitat to *Erythronium howellii*, one large population of *Delphinium nudicaule* was found in the ecotone between a Douglas-fir-tanoak forest and rock outcrops. It is considered common in California, but relatively few sites have been found in Jackson and Josephine counties.

*Salix delnortensis* can be found in serpentine riparian areas. Usually found in gullies on serpentine at low elevations. It is found in Curry and Josephine counties in Oregon and Del Norte and Siskiyou counties in California. Few sites are known on the Medford District.

In dry serpentine, the species *Senecio hesperius* and *Monardella purpurea* have been located. *Senecio hesperius* is endemic to the Illinois Valley. Both species are usually found on dry, rocky serpentine slopes or serpentine savannahs where grass species may be competing with it. Populations tend to be sparsely scattered when found.

*Limnanthes gracilis var. gracilis* can be found in ephemerally wet areas in both serpentine and non-serpentine soils at low elevations. It is found in the Illinois Valley, but also the Rogue Valley in Josephine county (and historically in Jackson county). Its habitat (wet valley grasslands and openings) is highly threatened by development and agriculture throughout its range.

Finally, the serpentine fen species are the rarest of the species found in the project area. This is due to the limited habitat available for these species. Acreage is much smaller for this habitat versus dry serpentine savannah habitats. *Epilobium oreganum* can be found in wet serpentine areas in Josephine county as well as in northern California. *Viola primulofolia ssp. occidentalis* has the same species range. *Carex livida* has a much larger range throughout the Northwest. In southwestern Oregon, though, it is only documented in serpentine wetlands.

Much of the habitat of these serpentine species was disturbed in the past by mining operations, leaving it difficult to determine if these plants have experienced a decrease in population numbers over the years.

b) Non-vascular plants

The moss species, *Pseudoleskeela serpentinse*, has been located in rocky serpentine areas. This species appears to be endemic to serpentine substrate. Also, one occurrence of *Crumia latifolia* was located. This moss, usually found on calcareous substrate, was located in a seasonal drainage in serpentine. No other non-vascular Special Status species have been located.

b. Environmental Consequences

1) Alternative 1: No Action

The effects of the No Action alternative on Special Status species would be both positive and negative depending upon the species. Canopy closures and the limited amount of moist microsites would be maintained as well as mycorrhizal connections.

The negative effects of the No Action alternative on special status species would be the increased risk of wildfire. In the event of a wildfire, areas with high fuel hazards and dense understory could burn with intensity sufficient to eliminate these species from the site for at least the short term. This could threaten *Cypripedium* populations and habitat which have been shown not to survive such fires (Management Recommendations). Increased grass thatch and encroachment of shrub species would continue on the serpentine savannahs with the consequent decline of habitat for special status species and a decline of population diversity and density. The habitat for *Erythronium howellii* could, for example, eventually be reduced in quality as edge openings become filled.

2) Alternative 2 & 3

a. Effects of Recreation, Cultural Resources, Special Forest Products, and Young Stand Management

Due to inclusion and implementation of the project design criteria there should be no effects to Special Status Plants.

b. Effects of commercial thinning-

Only one *Cypripedium* population is located in a commercial thin unit in both alternatives (T41S-9W-10, unit 10-3B). As stated in the Vascular Plant Management Recommendations (1998), activities that remove canopy in large areas or patches close to *C. fasciculatum* populations could alter the microclimate or nearby sites by creating edge effects. Depending on distance and exposure, there could be changes in several microclimate variables such as air temperature, relative humidity, soil temperature and moisture which could affect these populations. Air temperatures, for example, can be increased over 100 meters into an uncut area from a cut edge. (Chen 1991). With the implementation of the PDFs, there should be no effects to special status and T&E species.

c. RNA values

Designation of the RNA (a RMP level decision) will fill a vegetation cell not currently well represented in the Research Natural Area system in Oregon. The RNA did not burn during this fire in 2002 and therefore could provide a research "control" for native species recovery studies on the Biscuit fire. The treatments proposed as a part of RNA alternative 2A would not adversely impact sensitive or S&M species. The vegetation types represented have developed under a regime of natural fire. The value of the proposed RNA would not be diminished and may be enhanced by the proposed burning treatment.

d. Effects Common in Riparian treatments -

Riparian treatments most likely affect non-vascular species associated with riparian habitat. No Special Status riparian non-vascular species were located during surveys. Therefore, there are no

effects associated with these treatments in either alternative.

e. Effects of Alternatives on Botanical Resources -

*POC treatments:* Effects of sanitation could include changes in microsite from canopy removal. Removal mechanically will speed up the process already started by infection. Project design features are designed to reduce direct impacts to these occurrences, but due to the large number of existing sites, these changes to microclimate may still occur. Direct impacts would include damage or mortality of individual plants. None of the species occurring should be adversely impacted by the proposed POC treatments. The individual populations will continue to persist at the site.

*Stand Harvest Treatments in Older Seral Stages* - Alternative 2 includes more acreage of commercial thin treatment and therefore potentially affects more occurrences of special status species than Alternative 3. Project design features (e.g., buffering) should mitigate any direct effects to the three species with habitat in harvest units (*Cypripedium fasciculatum*, *C. montanum, Erythronium howellii*). Three of six occurrences of *C. fasiculatum* and one of two *C. montanum* occurrences occur in harvest units in alternative 2. The remaining are in fuel hazard reduction units and will be buffered. Most of the *Erythronium howellii* populations are found in fuels units or on the edge of harvest units.

Indirect effects related to *C. fasciculatum* and *C. montanum* would be reduction of potential habitat on northerly, moist microsites. Such potential habitat is given consideration in this analysis because of the possibility that dormant individuals may exist. Reduction in potential habitat is not expected to have an effect on the species' distribution or overall viability. The species occurrence numbers do not indicate any trend toward the need for listing by either the state of Oregon or federally.

Indirect effects related to *Erythronium howellii* should be beneficial. Opening up the canopy on forest edges should increase productivity of populations by allowing more light and precipitation to reach the forest floor.

Project design features should ensure that these actions will not conflict with the habitat needs of special status plants within the Botanical Emphasis Area and not trend any of these species towards ESA listing.

f. Prescribed burning/fuel hazard reduction treatments and Wildlife habitat restoration/enhancement -

The proposed treatments should enhance native plant habitat to the benefit of the serpentine plants and such species as *Erythronium howellii* that require openings. Treatments will decrease encroachment of trees into serpentine savannahs, reduce thatch and reduce fuel loadings to a point where fire will not have a harmful effect. By reducing fuel loadings and thus potential burn severity, fires are less likely to smolder in the litter/duff layer which can impact root systems. Also, these treatments should promote a more diverse herbaceous layer.

Alternative 2 proposes fuel reduction and wildlife habitat restoration on 1,265 more acres than Alternative 3. These extra acres are primarily in riparian reserves and within the proposed RNA; the focus being on wildlife habitat restoration. Alternative 2 will leave the landscape as a whole more fire-

resistant and will enhance habitat at a greater scale for serpentine savannah areas. It could also introduce fire where fuel conditions may fall within the natural regime for the area. It assumes that all acreage needs treated at the same level of intensity.

g. Slashbuster –

The fire-related effects of slashbusting on native vegetation could be both positive and negative. By underburning burning slash instead of handpiling, conditions for prescribed burning would better replicate natural, low intensity burns on the landscape, as long as the slash layer is not too thick. A thick layer of slash (>6") may, however, create high intensity fire which could damage the soil and seedbed to a point where many species in the herbaceous layer would have difficulty re-establishing. This potential would decrease over time as slash settles and decomposes. Observations of slashbuster treatments in very dense large manzanita stands in the Ashland Resource area (Hosten, unpublished data on 2003) suggest that very thick layers of slash can stifle native bunchgrasses which can then be out-competed by non-native annual grasses. These vegetation densities are much greater than occur in the present project area and no similar impact is anticipated.

3. Cumulative Effects -

For the forested environments, the reasonable foreseeable future actions that will take place in the Matrix and on county and private land will include continued timber harvest, understory treatments and clearing of forest and valley lowlands for development. BLM actions in the Illinois Valley may include the South Deer, the East Fork Illinois, Free and Easy II and the East Kerby landscape management projects. More special status or S&M plant populations will continue to need protection and management as these actions are carried out on federal lands. Also, any populations on non-federal lands will most likely remain undetected and unprotected. The long term effect is a reduction in habitat for these species on non-federal lands. This reduction will not lead to the listing of the forested species, because of populations are stable in other portions of their range and one species is adapted to canopy openings and edge habitats.

The reasonable foreseeable future actions on serpentine habitats of the Illinois Valley are development, mining, road building and off highway vehicle use. All of these actions have led to a reduction in available habitat and will continue to do so as human populations increase in this region. Mining is especially a threat. Serpentine soils provide some of the world's only nickel and chromium deposits. Mining in the vicinity of Waldo has already been extensive and more mining is proposed in the Rough and Ready creek drainage. The majority of serpentine BLM holdings in the Illinois Valley have mining claims associated with them. The open nature of serpentine areas lend themselves to easy access and road building. This in turn, allows for entry by OHVs which have been a problem throughout the region. The long term effects on these species could be adverse depending on the amount of mining and OHV use, especially for those species endemic to the Illinois Valley.

On the other hand, the habitat restoration prescribed burning planned for most of these projects will help to return serpentine areas to a more naturally functioning state. Also, hazard fuel reduction treatments involving thinning of dense understory in these projects will help to return forests to healthier conditions simulating a more natural fire regime. This, in turn, will reduce the risk of high intensity fire.

Definitions/Management recommendation Citations

* Mycorrhiza are underground fungi that provide a close physical association between the fungus and the roots of a plant, from which both the fungus and plant appear to benefit. A mycorrhizal root takes up nutrients more efficiently than one not associated with mycorrhiza. Mycorrhizal fungi (also known as ectomycorrhizal) are essential for host plant nutrient uptake and play important roles in nutrient cycling in many forests. Studies from the Pacific Northwest indicate that forest management activities can reduce populations of mycorrhizal fungi and forest regeneration success (Luoma, Eberhart, Amaranthus 1997).

Management recommendations have been based on the Record of Decision (ROD) Northwest Forest Plan, the Medford District Resource Management Plan, the BLM Manual 6840, Medford District botanist advisement and professional knowledge.

### 3.2.5. Resource: Wildlife

a. Introduction

The W.F. Illinois project is located in the West Fork Illinois River 5th field watershed. This 5th field watershed makes up an upper portion of the Illinois River Sub-basin (4th field watershed). The BLM manages 5,644 (7%) acres of land in the watershed with a majority of it dominated by serpentine forest with inclusions of non-forested areas. Past land management actions include mining, road construction, and timber harvest.

Currently, there are 751 acres of BLM administered forest land in the watershed, functioning as northern spotted owl (*Strix occidentalis caurina*) nesting, roosting and foraging habitat (McKelvey class 1 & 2). There are no spotted owl cores and no documented spotted owl nests. No Critical Habitat for the northern spotted owl has been designated by USFWS within the watershed.

Habitats within the project area include woodlands, riparian, meadows, late-successional forest, snags, down wood, Jeffrey Pine savannahs, serpentine meadows and brushfields. Habitat for a number of sensitive species exist including the northern spotted owl (*Strix occidentalis caurina*), red tree vole* (*Arborimus longicaudus*), great gray owl (*Strix nebulosa*), Del Norte salamanders* (*Plethodon elongatus*), Northern goshawks (*Accipiter gentilis*), and other raptors as well as the Fringed Myotis bat species. (* these species have been detected).

Surveys have been completed for all Survey & Manage species. Potential habitat does exist in the project area for some of these species. The following discussion of impacts would be based on alteration of potential habitat. For the purposes of the discussion, it is assumed that these habitats are occupied. As a result, the actual effects would be equal to or less than what is presented.

b. Affected environment

The project area is located along the eastern boundary of the WF Illinois River watershed. A portion of the proposed project is located west of Highway 199 where serpentine soils strongly influence vegetation types and habitats.

The proposed project area incorporates approximately 2,875 acres. Timber harvest is proposed on approximately 684 acres under alternative 2 and 442 acres under alternative 3. Most of the stands are

dominated by Douglas-fir and ponderosa pine plant associations. For many of the stands, alternatives 2 & 3 propose the first commercial harvest entry, as evidenced by lack of stumps.

There are approximately 504 acres of mature forest within the project area. Of these acres only 39 meet spotted owl nesting habitat (McKelvey rating #1). There are an additional 423 acres of dispersal habitat and 465 acres of foraging habitat for spotted owls. These habitat forest patches occur infrequently and their distribution is fragmented within the watershed. Past management activities have reduced the current quantity and distribution of late-successional habitat. Additionally, the serpentine derived soils occurring throughout the watershed are not capable of producing late-successional forest habitat suitable for species such as the spotted owl. Furthermore, dispersal corridors often times associated with late-successional riparian reserves are also lacking within the watershed. Watershed riparian reserves located within serpentine soils are characterized by conditions not capable of providing late-successional forest habitat. However, these forested stands do provide dispersal habitat and connectivity for species associated with older forest from the East IV/Williams LSR to the West IV LSR. In addition, there are patches of habitat that provide connectivity within the watershed WA p. 51).

Non-forest habitats such as serpentine meadows, chaparral, oak woodlands and Jeffrey Pine savannahs are prevalent in the project area. These habitats are dependent on fire for maintenance and restoration. A majority of these lands have not burned for more than 50 years and are currently outside of what might be considered their natural range of variability. Meadows, chaparral brush fields and oak woodlands provide habitat for a number of species and are especially important areas for migratory and resident birds. Species of concern associated with these habitats include acorn woodpeckers (*Melanerpes formicivorus)*, flammulated owls (*Otus flammeolus)*, sharptail snakes (*Contia tenuis)*, California mountain kingsnakes (*Lampropeltis getulus)*, and ringtails (*Bassariscus astutus).*

b. Environmental Consequences to Habitats

1) Alternative 1: No Action

a) Late-Successional forests

Late-successional forest habitat would continue to develop at its current rate. Successional development of these stands would continue to be influenced by fire suppression, high stem densities and ladder fuels. The hazard of stand replacement fire events would be maintained.

Stand development patterns would continue to differ from pre-fire suppression period patterns. Fire suppression efforts have interrupted the frequency of low intensity fires across the project area and within the larger watershed. This has resulted in higher stem densities of shade tolerant species, and the decline in shade intolerant tree species that are moderate to highly fire tolerant. This has resulted in stand structure becoming simplified by the loss of species such as Pacific madrone and California black oak that create horizontal structure. The high stem densities in the under story layer provides for higher fuel loading and acts as ladder fuel contributing to the high risk of a stand replacing fire event. Additionally, the under story structure of these stands clutters the mid to lower canopies affecting the flight paths for raptors and bats.

Hardwoods, such as tanoak are shade tolerant and fire intolerant. Without the fire disturbance mechanism, these hardwoods are long lived and stagnate the development of large structure in conifers as their high stem densities compete for available resources. Additionally, the creation of gaps in the canopy are dominated by these hardwoods, as they out compete conifers, resulting in simplified structure in the under story. The development and recruitment of snags and down wood can decline as conifer regeneration is lacking. Species dependent on large diameter snags and down wood such as the pileated woodpecker, and a host of secondary cavity excavators can be negatively affected when these structures are deficient on the landscape.

The potential for a stand replacing fire event is increased by the amount of built up fuels in these stands. Predicting a fire event or its actual effects are impossible to estimate. Late-successional forest habitats can be modified to varying degrees depending on fire intensity. A moderate ground fire may modify late-successional forest by creating gaps in the canopy, encouraging shade intolerant hardwood tree species (*e.g*. California black oak, Oregon white oak) and increasing horizontal structure. Species utilizing these tree species for mast and berry crops, as well as cavities and nesting structure may benefit. A high intensity stand replacing fire can move a stand to an early successional stage. These types of events occurred historically, however are thought to be more detrimental than historic due to the resultant fuel levels across the landscape from fire suppression.

c) Jeffrey Pine Savannahs

Jeffrey pine savannahs and serpentine meadows, under the no action alternative would continue their declining trend for both extent and vitality due to the invasion and encroachment by fire intolerant species. Lack of fire has resulted in encroachment and establishment of shrubs and trees. Stem densities are higher than historic, and are composed primarily of shrubs, which shade out native grasses. These savannahs and meadows lack their historic abundance of grasses, which has changed these plant communities negatively affecting wildlife species such as the flammulated owl, and western blue bird. The no action alternative would fail to address the need to return fire to these fire dependent plant communities and maintain these unique habitats within the project area and the watershed.

d) Riparian Reserves

Riparian areas and their associated upland vegetation under the no action alternative would continue to develop at their current rates. Mature and late-successional riparian habitat areas are limited within the project area due to natural conditions. However, the lack of fire has created higher stem densities, fuel loading and a pattern of development not consistent with the pre-fire suppression period. This situation will prolong the development of older forested habitat conditions that are important to species dispersing across the watershed. Riparian areas currently provide marginal connectivity between the East IV/Williams LSR and the West IV LSR. The no action alternative would fail to address the need to accelerate the development of mature and late-successional forested habitats to provide better than marginal connectivity between these LSRs.

2) Alternative 2 and 3: Action Alternatives

a) Late-successional forests

Alternative 2 proposes treating 357 acres of late-successional forest habitat and alternative 3 proposes 226 acres. Late-successional forest habitat is limited within the project area due to past management activities and natural conditions. Treatments proposed would reduce canopy closures to a minimum of 40% where commercially thinned. In stands with group selection, canopy closures would be less than 40%, and created openings would be consistent with natural disturbance regimes, ranging in size from ½ to 3 acres, with the average being ½ to 1 acre in size. Stands treated under alternatives 2 & 3 would retain varying amounts of structural components associated with older forest, including a recruitment source for snags, down wood and large trees but would lack the high canopy closure associated with late-successional habitat. Hardwood species such as Oregon white oak, California black oak and Pacific madrone provide the majority of horizontal structure and complexity within the project area. These trees improve the overall quality of forest habitats by producing mast and berries, as well as providing nesting and resting structure for a variety of wildlife. They are also host plants for a number of mycorrhizal species that produce fruiting bodies, an important primary food source for species such as the Northern flying squirrel (*Glaucomy sabrinus*). In addition, a number of molluscs are known to utilize hardwood litter as food. Retention of these components maintains within stand diversity and the species composition pattern similar to natural disturbance regime conditions.

The short term effects to these stands include the decrease in canopy closure, horizontal and vertical complexity, and stem density as they relate to wildlife habitat. Tree canopy closure and understory response to proposed treatments may require 20+ years to return to canopy closures of 60% and greater. These more open canopy closure conditions may lead to an increase in use by species such as bats, hairy woodpeckers and the Great horned owl. Micro-climatic conditions and micro-sites that some species need may not be met in stands with canopy closures less than 40%. For example the Del Norte salamander and some mollusk species appear to require cool moist forest floors and may be absent from warmer drier conditions that are anticipated post harvest. Additionally, a quick response from shrubs and other herbaceous species may occur post harvest in response to increased sunlight.

Long term effects to these stands are expected to include an increase in diameter of residual trees, vigor, and a reduction in stem densities consistent with pre fire suppression disturbance regimes. Structural complexity and development of stands would be accelerated, compared to the no action alternative. In the long term stands would develop mature and late-successional characteristics important to species such as the spotted owl. Conifer regeneration would occur providing for future snag and down wood habitat. Retained hardwoods crown ratio would increase improving mast and berry crops. Additionally, these stands would increase the amount of connective habitat available for dispersal of species between the East IV/Williams LSR and the West IV LSR. Alternative 2 would accelerate approximately 5% more of the development of late-successional forest habitats than alternative 3.

b) Jeffrey Pine Savannah

Alterative 2 proposes to treat 974 acres of Jeffrey pine savannah habitat and alternative 3 proposes 597 acres. Treatments include a variety of thinning and burning. Short term effects would include a significant reduction in the amount of shrub structure and stem densities. Some shrubs will sprout immediately following treatment, as will native grasses from the available sunlight. With the return of fire and the removal of competing shrub species, the long term affect would include an increase in the

native grass and herbaceous layers. This change in plant community would also affect wildlife species use. It is expected that with the increase in grasses and decrease in shrubs that small mammals and insects that the flammulated owl and western bluebird prey upon will return. Alternative 2 will treat approximately 13% more of this declining habitat than alternative 3.

c) Riparian Reserves

Commercial treatment would include thinning from below and sanitizing Port-Orford cedar where roads intersect these riparian areas to prevent the spread of *Phytophthora lateralis (*PL*)*. Alternative 3 would sanitize Port-Orford cedar where roads intersect riparian areas to prevent the spread of PL. Short term effects for both action alternatives would include the loss of Port-Orford cedar along stream road intersections. Long term effects for both action alternatives would include the prevention and spread of PL along the road stream intersections treated. Resistant Port-Orford cedar would prevail contributing to the tree diversity and providing structure for riparian dependent species.

Alternative 2 would commercially treat approximately 115 acres of riparian reserves accelerating the development of late-successional forested conditions. Short term effects would include a reduction in canopy closure and stem densities. These conditions may negatively affect some species that prefer higher canopy closures. Commercial treatments would be restricted to the outer most portions of the reserve areas. Long term effects of these treatments would be the development of habitats important to dispersing species from the East IV/Williams LSR and the West IV LSR. Alternative 3 would not contribute to the development of mature and late-successional habitat conditions within the project area.

d) Snags

Current snag levels vary within the project area due to the level of past management activities, including fire suppression. Short term effects from proposed commercial timber harvest and under burning activities in alternatives 2 & 3 could reduce existing snag levels. Marking guidelines for commercial harvest activities include methods to reduce and mitigate these potential impacts. Additionally, snags may be created from disturbance associated with harvest and burning activities. Green tree retention levels for future snags target the upper range by plant association group and the largest trees, as described in the marking guidelines. This meets or exceeds the standards and guidelines for managing primary cavity excavator levels identified by land allocation in the RMP. Long term effects from proposed treatments include the accelerated development of large tree structure that includes an increase in diameter growth and conifer regeneration for future snag recruitment. Treatment will ensure that future snags would be the appropriate size to provide for the nesting, roosting and foraging habitat required by species such as the pileated woodpecker, fisher, bats and spotted owls. Alternative 2 will treat more acres and move stands towards their historic range of variability providing for more snag habitat in the future than alternative 3.

e) Young Stand Development

Alternative 2 proposes to treat 106 acres of precommercial thinning/brushing. Treatments proposed are located within managed plantations and riparian reserves, and are composed of early and mid-seral forested conditions. Alternative 3 proposes 94 acres of precommercial thinning/brushing. Short term effects for both action alternatives include a decrease in canopy closure and stem density.

Precommercial thinning will accelerate the development of stands compared to no treatment. Long term effects include an increase in tree size and canopy closure, as conifers out compete hardwoods. Long term these treatments contribute to the development of future mature and late-successional habitats that benefit late-successional related species such as the spotted owl. Alternative 2 proposes to treat 12 acres of riparian reserve as compared to alternative 3. Alternative 2 will contribute to developing larger trees faster along the treated riparian reserves than alternative 3. This will contribute to increasing the amount of connective habitat between the East IV/Williams LSR and the West IV LSR.

f) Road Work

Under alternatives 2 & 3 approximately 1 mile of new road would be constructed in the project area. Post-project, short temporary spur roads would be closed. Proposed road maintenance and road improvement in the project area would improve drainage and water quality to the local streams, benefiting aquatic species such as frogs, salamanders and invertebrates. Short term effects for both action alternatives include a small increase in the amount of open road miles within the project area and watershed. Road work and subsequent hauling activities would temporarily increase noise disturbance along these roads. This kind of disturbance may temporarily affect individual wildlife species, but not populations. Long term effects for both action alternatives include the potential increase in access from motorized vehicle use on these new roads. However, the small mileage increase is insignificant and is not likely to negatively affect wildlife species use in the project area.

g) Fuel Hazard Reduction

Alternative 2 proposes treating 271 acres of uplands and 94 acres of riparian reserve. Alternative 3 proposes 108 acres of upland treatment. Thinning and burning would reduce fuel loading, stem densities and ladder fuels, reducing the risk for a stand replacing fire in treated stands. Both action alternatives would reduce fuel loads to various degrees. Thinning may be implemented utilizing a slashbuster machine or by chainsaws. Short term effects for both action alternatives include a reduction in under story structural complexity for species that utilize shrubs and small trees for cover, nesting and foraging. The reduction of hazard would lesson the possibility of a stand replacing fire. In areas where hand piling occurs, piles would provide a short term source of cover and foraging areas for small mammals and birds such as the winter wren. Long term effects for both action alternatives include moving stands toward their historic range of variability across the project area by providing for a mosaic of habitats. Thinning will assist in accelerating the development of late forest structure in treated stands, while still providing for a mosaic of habitats. Areas of small trees and shrubs would be maintained to provide for this mosaic of vertical and horizontal complexity in treated stands. Alternative 2 will treat more acres than alternative 3, contributing to reducing the risk of a stand replacing fire event on more acres within the project area.

c. Affected Environment and Environmental Consequences to Species

1. Northern Spotted Owls

a) Existing environment

There are approximately 504 acres of mature forest within the project area. Of these acres there are

only 39 that meet spotted owl nesting habitat (McKelvey rating #1). There are an additional 423 acres of dispersal habitat and 465 acres of foraging habitat for spotted owls. There is no designated Critical Habitat within the project area. The project area is outside of any known home ranges of spotted owls, but spotted owl habitat is present in the project area. Habitat for spotted owls is limited within the watershed due to past management activities and natural conditions.

b) Environmental Consequences

1) Alternative 1: No Action

Under the no action alternative habitat for the Northern spotted owl would remain at its current level. Successional development of stands would continue to be influenced by fire suppression, high stem densities and ladder fuels. The risk of a stand replacement fire event would be maintained. Development of late-successional habitats in the project area would be delayed by no action because stand development patterns have changed due to fire suppression efforts. Connectivity from the East IV/Williams to the West IV LSR would remain at its current level.

2) Alternatives 2 and 3: Action Alternatives

Alternatives 2 & 3 propose commercial harvest in spotted owl habitat. Alternative 2 proposes commercial harvest in 258 acres of spotted owl habitat. Alternative 3 proposes 226 acres. Proposed treatments would modify spotted owl habitat from nesting, roosting and foraging habitat to dispersal habitat. Currently there are no known spotted owls utilizing the project area for reproduction. Spotted owl use of the project area is limited to foraging and dispersal of adults and young. Short term effects for both action alternatives to spotted owls would be the reduction in canopy closure and structural complexity, that would make stands more accessible by predators such as great horned owls. Long term effects for both action alternatives would include an increase in average tree diameter, canopy closure and structural complexity consistent with late-successional forests that this species is dependent upon. Treatments will accelerate development of stands to late-successional conditions faster than the no action alternative. Alternative 2 will accelerate development of stands to late-successional conditions on approximately 1% more area than alternative 3.

There will be no incidental take of spotted owl in the project area. Suitable spotted owl habitat will be degraded to dispersal habitat. This project and the resultant effects to spotted owls are compliant with the formal consultation with U.S. Fish and Wildlife Service (USFWS) issued in the Biological Opinion (#1-14-03-F-511, October, 2003).

2. Red Tree Vole

a) Existing environment

There are approximately 2,850 acres of potential RTV habitat in the project area. The RTV is an arboreal species of rodent with very low dispersal capabilities. The broad management objective for this species is to retain sufficient habitat to maintain its potential for reproduction, dispersal and genetic exchange. Surveys have been conducted in appropriate habitat within the project area.

b) Consequences

1) Alternative 1: No Action

Forested stands within the project area would continue to develop towards older forest conditions through natural successional pathways. Successional development of stands would continue to be influenced by fire suppression, high stem densities and ladder fuels. The risk of a stand replacement fire event would be maintained. Development of late-successional habitats in the project area would be delayed by no action because stand development patterns have changed due to fire suppression efforts. Connectivity from the East IV/Williams to the West IV LSR would remain at its current level. There would be no disturbance associated with the no action alternative.

2) Alternatives 2 and 3: Action Alternatives

Red tree vole (RTV) sites have been buffered per protection measures outlined in the management recommendations. Short term effects to RTV from both action alternatives include the impediment of successful dispersal beyond established buffers into treated and untreated adjacent habitats, until canopy closures recover to 60% and greater. Long term effects for both action alternatives include an increase in mature and late-successional habitats within the project area, with high canopy closures that may facilitate more successful dispersal of the species across the landscape. Additionally, the proposed pre-commercial thinning and brushing throughout the project area will accelerate the development of potential red tree vole habitat in the future, contributing to the maintenance of the species and its habitat within the watershed. Alternative 2 proposes to treat more acres than alternative 3, and would make available more potential habitat for red tree voles in the long term.

3. Northern Goshawks

a) Existing environment

There are approximately 638 acres of potential goshawk reproductive habitat within the project area. The goshawk is a generalist species that utilizes a variety of seral forest habitats. Many of the forested stands within the project area have high stem densities in the mid to lower canopies cluttering the flight paths for this species.

b) Consequences

1) Alternative 1: No Action

Forested stands would maintain their current successional development. Successional development of stands would continue to be influenced by fire suppression, maintenance of high stem densities, ladder fuels and hazard of stand replacement fire events. Attainment of future mature and late-successional habitat would require more time as compared to the action alternatives. There would be no disturbance associated with the no action alternative. Goshawks present within the project area would likely remain capitalizing on the available habitats. Currently stands are cluttered inhibiting goshawks from foraging effectively.

2) Alternatives 2 and 3: Action Alternatives

Goshawks were not detected within the project area during surveys. However, it is suspected that goshawks are present. Alternatives 2 & 3 propose a variety of treatments within the project area. Short term effects for both action alternatives would include a reduction in canopy closures and structural complexity. This condition may make stands more conducive to goshawk for foraging and nesting. However, it may also allow predators such as the great horned owl to become established in these stands, presenting a threat to adults and potential young of goshawks. Treatments proposed would be effective at reducing the amount of under story clutter providing for improved hunting opportunities for goshawks. Long term effects for both action alternatives include the accelerated development of mature and late-successional habitats across the project area, that would benefit goshawks by increasing potential nesting and foraging habitats. Alternative 2 proposes to treat more acres than Alternative 3, these treatments would be beneficial to goshawks in the long term.

4. Del Norte Salamanders

a) Existing environment

Habitat is located throughout the project area. Del Norte salamanders are intricately tied to areas with rock and talus. This type of micro-habitat is sporadically distributed across the landscape, occurring primarily near rock outcrops, ridge tops, and along riparian areas.

b) Consequences

1) Alternative 1: No Action

Forested stands would continue to develop through natural successional pathways towards older forest conditions. Successional development of stands would continue to be influenced by fire suppression, high stem densities and ladder fuels. The risk of stand replacement fire events would be maintained. Attainment of future late-successional habitat would require more time as compared to the action alternatives. Del Norte salamanders are associated with rocky substrates where sites may be more unproductive and slower to develop these characteristics.

2) Alternatives 2 and 3: Action Alternatives

Both action alternatives propose treatments within talus habitats for Del Norte salamanders (*Plethodon elongatus*). Surveys have been partially completed for the project area. Pre-disturbance surveys are no longer required for this species. Potential habitat has been identified and treatments would not reduce canopy closures below 40%. Surveys detected presence in T40S,R8W, Sect 33, T41,R9W, Sec 2, 10, 12, 13, and 15. Del Norte sites have been buffered as per protection measures as outlined in the management recommendations. Additionally, fuels treatments in habitat would be hand piled and burning of piles would occur only when temperatures are near freezing or below to avoid direct mortality to salamanders. Short term effects for both action alternatives would be a reduction in canopy closure that may change current cool moist forest floor conditions to warmer and drier conditions post harvest. This may affect Del Norte use of some talus habitats. Long term effects for both action alternatives would be the reduction in stem densities and ladder fuels, resulting in a lower risk of a stand replacing fire event. Long term this would contribute to the maintenance of high

canopy closures and the sustainability of the Del Norte populations located at these isolated talus habitats within the project area. Alternative 2 proposes to treat more Del Norte habitat than alternative 3, and reduce the risk of a stand replacing fire event over more of these habitats.

5. Great Gray Owl

a) Existing environment

There are approximately 638 acres of potential great gray owl reproductive habitat within the project area. Locally, Great grey owls have been located nesting in a variety of stand types, but appear to prefer mature park like stands with a closed canopy (>60%) and room for flight is a common factor. Foraging occurs in open stands, old clearcuts, natural meadows, and agricultural land. Many of the forested stands within the project area have high stem densities in the mid to lower canopies cluttering the flight paths for this species. Surveys have been conducted in appropriate habitat within the project area, however no owls were detected.

b) Consequences

1) Alternative 1: No Action

Forested stands would continue to develop along their current pathways. Successional stand development would continue to be influenced by fire suppression, high stem densities and ladder fuels. The risk of stand replacement fire events remain. Attainment of future late-successional habitat would require more time as compared to the no action alternative. Foraging areas would continue to be encroached upon by fire intolerant plant species thereby reducing potential foraging opportunities.

2) Alternatives 2 and 3: Action Alternatives

Alternatives 2 & 3 propose treatment in potential great gray owl habitat. Treatments may modify potential nesting habitat to a non-nesting condition. Short term effects for both action alternatives include reducing canopy closures and structural complexity within stands providing opportunities for predators to become established, such as the great horned owl. However, these habitat changes will also open stands to allow for unobstructed flight potentially increasing the amount of suitable habitat. Long term effects for both action alternatives include the accelerated development of late-successional forest habitat conditions and enhancement of foraging areas from thinning and burning. Alternative 2 proposes to treat more acres than alternative 3, providing more potential nesting and foraging opportunities in the future for great gray owls.

7. Songbirds

a) Existing environment

Potential habitat exists throughout the project area for songbirds, both migratory and non-migratory. A variety of habitats exist including mature and late-successional forest habitat, mid and early seral stages as well as shrub habitats.

b) Consequences

1) Alternative 1: No Action

Habitats would continue to development through their successional stages. Forested stands would move towards older forest conditions and grassland and shrubland areas would continue to be dominated by shrubs. Successional development in forested stands would continue to be influenced by high stem densities and ladder fuels. The risk of a stand replacing fire would be maintained. Meadows, oak woodlands and Jeffrey pine savannahs would continue to be encroached upon by small trees and shrubs. Both forest and non forest habitats conditions have been affected by fire suppression. Patterns of development have changed from the pre-fire suppression period patterns. Lack of fire as a disturbance mechanism has stagnated the development of habitats. The maintenance and development of habitats under the no action alternative would be prolonged as compared to the action alternatives. Some species of birds have benefited from the lack of fire, as others have declined due to habitats developing outside of their historic range of variability.

2) Alternative 2 and 3: Action Alternatives

Alternatives 2 & 3 propose treating a variety of songbird habitats within the project area. Short term effects to meadows, oak woodlands and Jeffrey pine savannahs for both action alternatives include a reduction in stem densities, shrub abundance and structure. These changes may affect species that have benefited from fire suppression, such as the Nashville warbler (J. Alexander, Per. Com.). Long term effects for both action alternatives include an increase in native grass abundance and the maintenance and enhancement of meadows, oak woodlands and Jeffrey pine savannahs. Species that would benefit long term from these treatments include the flammulated owl, western bluebird, small mammals such as mice and voles and a host of insects associated with these habitats. Alternative 2 proposes to treat more acres of Jeffrey pine savannah than alternative 3. Alternative 2 would benefit more species associated with this unique plant community than alternative 3.

Short term effects to forested stands for both action alternatives include a reduction in stem densities, ladder fuels and canopy closure. Treatments are intermediate in design and would retain large structure and existing large diameter snags and down wood. Species that may have benefited from lack of fire and dense under stories may be affected by these treatments. However, it is likely that by moving stands towards their historic range of variability that some species that have been negatively affected by fire suppression would benefit. It is expected that there may be a shift in songbird composition and abundance in treated stands in the short term. Long term effects for both action alternatives include the accelerated development of mature and late-successional forest conditions for interior forest species. Additionally, development of these conditions would contribute to connectivity between the East IV/Williams LSR and the West IV LSR. Alternative 2 proposes to treat more acres than Alternative 3, contributing to moving stands within the project area towards their historic range of variability benefiting those species historically present.

8. Mollusks

a) Consequences

Potential habitat exists throughout the project area for mollusks. All lands identified for commercial timber harvest were surveyed for Survey and Manage mollusks. None were located. *Helminthoglypta hertleini* utilizes rocky talus in open exposed slopes. Proposed treatments are not expected to negatively affect this species of mollusk.

9. Bats

a) Existing environment

Potential habitat for forest dwelling bats occurs throughout the project area. Bats use a variety of habitats for foraging, as well as day and night roosting. Many forested stands within the project area are not suitable for foraging bats. The mid to lower canopies are cluttered by high stem densities and ladder fuels from lack of fire. Bats prefer stands that are uncluttered for flight. There are no caves or adits known within the project area.

b) Consequences

1) Alternative 1: No Action

Forested stands would continue to develop along their current pathways. Successional development of stands would continue to be influenced by fire suppression, high stem densities and ladder fuels. The risk of stand replacement fire events would be maintained. Attainment of future late-successional habitat would require more time as compared to the no action alternative. Potential foraging areas would continue to be unavailable due to cluttered flight paths from high stem densities. These conditions also inhibit bats from utilizing large diameter snags in stands for roosts. Development of large green trees and snags important to bats would be prolonged under the no action alternative compared to the action alternatives.

2) Alternatives 2 and 3: Action Alternatives

Alternatives 2 & 3 propose treating potential habitats for bats. Short term effects for both action alternatives include a reduction in stem densities, ladder fuels and canopy closures. These conditions may benefit bats by opening up flight paths for foraging opportunities and access to roosts. Increase in canopy closure may also allow predators to become established in treated stands. Long term effects from proposed treatments include the accelerated development of large tree structure that includes an increase in diameter growth and conifer regeneration for future snag recruitment. Treatment will ensure that future snags would be the appropriate size to provide for the roosting and foraging habitat required by many bat species. Alternative 2 would treat more acres and move stands towards their historic range of variability providing for more snag habitat in the future than alternative 3.

d. Cumulative Effects

Cumulative effects within the project area which result from the incremental impact of the alternatives and added to other past, present and reasonably foreseeable future actions regardless of whom undertakes the action are described. Past management activities from county, state, federal and private land managers in the WF Illinois river watershed have altered the historic condition These changes

have come about through fire suppression, mining, road building, grazing, land development, agriculture and timber harvesting. The majority of remaining older forest occurs on public lands managed by the BLM and the Forest Service. These past activities have changed the distribution and abundance of many wildlife species within the watershed. Species associated with younger forested conditions have benefited from these changes. Species associated with late-successional forests, such as the spotted owl, have declined. Riparian habitats have been altered by road construction and mining, changing the hydrology and vegetation potential from historic conditions, which has affected the quality of connectivity habitat these areas provide. Land development and agriculture have converted low elevation habitats to non-habitat, reducing available habitats, creating barriers and prohibiting dispersal of some species. Overall, from these past activities there has been a loss of habitat.

Since the Northwest Forest Plan was signed there has been a shift in management on Federal lands in the Rogue Basin. Prior to the NWFP, timber sale harvest treatments were dominated by regeneration harvest. However, a shift away from regeneration harvest to density management has occurred. This has resulted in the treatment of many more acres as compared to regeneration harvest of equivalent timber volume. Density management has less severe effects to wildlife species than regeneration harvest. Additionally, with the recent National Fire Plan, management activities have been designed to move vegetation towards its historic range of variability on Federal lands by reducing fuel levels. This combination has resulted in treatments more in line with historic disturbance regimes. Recent timber sales completed on BLM lands within the watershed include 129 acres in the 3+3 project area and 44 acres in the Noreast project area. Associated with these sales have been additional areas of fuels reduction through thinning and/or burning. Cumulatively, these actions on Federal lands may have had some short term negative effects to some species. However, the long term effects to species and their associated habitats are expected to be beneficial as these stands move toward their historic range of variability.

Additionally, private, state and county timber harvest has occurred on approximately 40 acres (Rough & Ready Lands) in the past 5 year. Lands owned by Perpetua in the project area are planned to harvest 100 acres/year over the next 3 years. Other land owners' plans are unknown. Management standards on these lands provide for less protection than on Federal lands. It is assumed that these areas would provide less suitable habitat today and in the future as compared to Federal lands.

Some landscape management projects on Federal lands in the foreseeable future within the watershed include Free and Easy II.. It is anticipated that these projects would have similar short term effects that may be negative to some species. However, the long term effects are expected to be beneficial to many species, as treatments would move vegetation towards their historic range of variability.

In 2002, the Biscuit Fire burned almost 500,000 acres, primarily on the Siskiyou National Forest. Although 95,500 acres of spotted owl habitat was lost, the fire area had very little suitable and dispersal habitat for spotted owls prior. Such that, the area was unlikely to support large clusters of reproducing spotted owls. Furthermore, it has been determined that impacts from the Biscuit Fire would not likely preclude movement of spotted owls between the Coast and Cascades Provinces (BO, pg. 29).

Cumulatively all these actions would have some negative effects to some species. However, across the

watershed a mosaic of habitats in various seral stages is constantly changing. On Federal lands much of the management actions would result in more mature seral conditions providing a benefit to those species that utilizes older forested conditions. Federal lands also provide refugia for many species.

The WF Illinois project would have relatively minor affects to species persistence within the watershed. Cumulatively, this project combined with other non Federal actions would not contribute to the need to federally list any Bureau sensitive or assessment wildlife species.

### 3.2.6. Resource: Cultural

a. Affected Environment

Archaeological evidence indicates that human occupation of southwest Oregon dates back at least 8,000 years before present. The Native Americans who inhabited the project area were primarily hunter-gatherer-fishers. They occupied low elevation areas along major rivers and tributaries and utilized the hinterlands to procure food during the different seasons. The arrival of Euro-Americans in large numbers began in the early 1850s and can be directly tied to the discovery of gold. This abrupt influx of miners and settlers devastated the local Native American population. Through mining and agriculture their food resources were destroyed and the most productive lands were settled by the whites. Conflicts between the whites and the Indians eventually lead to the Rogue River Indian Wars and the subsequent removal of the Indians to the Grande Ronde and Siletz Reservations by 1856.

The West Fork Illinois River Landscape Management Project is situated in a region that has a rich and unique history, especially in mining. The earliest discovery of gold in Josephine County occurred in the Illinois Valley at Sailors Diggings in 1850 and the historic development of the county is directly tied to gold mining (Budy 2000:25). This rich find followed by others brought a large influx of miners into the area. As miners came into the area whole towns sprang up overnight. By the mid-to-late 1850s mining had become commonplace and a regular element of southwestern Oregon (Kramer 1999:18, 21). After the first World War, very little mining was being carried out in the area however the effects of mining on the landscape are still evident today. Sites within the project area include mining landscapes representing the development of different mining technologies, town sites associated with mining activities, cemeteries, isolated habitation flats and refuse scatters. Very few prehistoric sites have been recorded in the project area. Cultural resource inventories have been completed in the project area.

Previous archaeological research in the project area includes several small BLM management related survey projects and the Esterly Lakes Cultural Resource Survey encompassing approximately 3700 acres completed by EB Consulting in 2000. The Esterly Lakes survey included lands in the east and west fork Illinois River watersheds. Twenty eight sites were recorded in the West Fork Illinois watershed. Twenty three of those sites are historic and five sites are prehistoric. The historic sites represent a full range of local mining history including early transportation routes between Crescent City, California and southern Oregon. The mining site chronology extends from the discovery in Sailor's Gulch in the early 1850's to more recent prospecting in the 1930s and 1940's and includes sites representing all the major technological developments associated with hydraulic mining. Of the twenty three historic sites, nine were nominated and are listed on the National Register of Historic Places.

b. Environmental Consequences

1) Alternative 1 - No Action

During the planning period, none of the proposed actions would be implemented in the West Fork Illinois River watershed. There would be no thinning, young stand management, fire hazard reduction, or wildlife habitat restoration and enhancement. Current normal and ongoing road and facilities maintenance, fire protection, and resource protection activities would continue to occur. Fuels build-up would continue to increase and could result in a catastrophic fire which could threaten or destroy cultural resources. Vegetation would continue to encroach on cultural resources and could result in the damage and/or destruction of those resources.

2) Common to all Action Alternatives - (Alternatives 2 and 3)

Proposed management direction includes protecting and managing the integrity of all historic/prehistoric sites identified in the cultural survey. All known cultural sites have been identified. Proposed treatments would occur near the cultural resources. The sites would be buffered and no activities will occur within the buffered area. No impacts are anticipated to the sites during the proposed activities.

### 3.2.7. Resource: Fire and Fuels

a. Affected Environment

1) Fire Regimes

The fire regime in the project area is primarily one of low to mixed severity with frequent fires of low intensity. Historic fire frequency in the watershed below 3,500' is estimated to have been 7-20 years. These low severity fires kept sites more open and were less likely to burn intensely even under severe fire weather conditions. Periodic large stand destroying fires would also have occurred.

2) Fuel Hazard, Risk, Values at Risk and Priority Treatment Areas

Acreages in different fire hazard, risk, and values at risk levels on BLM lands in the project area are summarized in Table 3-6.

**Table 3-6: Hazard, Risk, & Value at Risk Classification (BLM lands)**

| Element | Total Acres | High | | Moderate | | Low | |
|---|---|---|---|---|---|---|---|
| | | Acres | % of Total Acres | Acres | % of Total Acres | Acres | % of Total Acres |
| Hazard | 5,644 | 2,135 | 38% | 2,972 | 53% | 536 | 9% |
| Risk | 5,644 | 1,302 | 23% | 3,473 | 62% | 868 | 15% |
| Values at Risk | 5,644 | 1,422 | 25% | 2,855 | 51% | 1,367 | 24% |

Source: West Fork Illinois Watershed Analysis (USDI 2003)

Fuel hazard reflects a wildfire's ability to spread and its ease of suppression. It is quantified based on weighted values of ladder fuel presence, fuel model, slope, position on slope, and aspect. The extensive high hazard condition reflects the history of fire exclusion and the resultant build up of ladder fuels, dense stands, and surface fuel loads.

Canopy base height and canopy bulk density are parameters not included in the above hazard ratings but are important components of overall fire hazard. These parameters can be changed with vegetation / fuel treatments. Current ranges of these parameters in the project area are shown in Table 3-7. From a fire condition class perspective, desirable canopy bulk densities are 0.0062 to 0.0023 lbs/ft3 or less and canopy base heights 6-14′ or greater. Based upon the fire hazard rating, the canopy base height, and canopy bulk density, the potential for a large fire to occur is high to extremely high for the project area.

**Table 3-7: Range of Canopy Bulk Density and Canopy Base Height**

| | Fuel Model 10 | Fuel Model 8 | Fuel Model 6 |
|---|---|---|---|
| Canopy Bulk Density (lbs/ft3) | 0.1819 - 0.2829 | 0.1111 - 0.2829 | 0 - 0.1111 |
| Canopy Base Height (ft) | 6 - 14.9 (max of 58) | 1.0 - 14 | 0 - 14 |

* Source: Multi-Resolution Land Characteristics and Western Oregon Digital Imagery Project satellite data acquired for FARSITE fire behavior modeling

Surface Fire Behavior Modeling - Evidence through fire behavior observations and various fire behavior and stand structure models show that meeting the treatment objectives can be effective at reducing the negative impacts of wildland fire. In the past, several areas of concern have been identified related to opening up the stand structure and resultant air flows within the stand that dry out fuels. The fire behavior modeling program, BehavePlus, was used to model results in forested and brush stands. Runs were performed looking at the current fuel model 10 (timber with litter and understory), that following treatments would change to fuel model 8 (closed timber litter) and fuel model 4 (chaparral – 6') changed to fuel model 6 (Dormant brush). Both of the pretreatment fuel models are well represented throughout the project area. This sort of transition could be expected in a Douglas-fir –pine /mixed conifer forest and in decadent brush fields. Short term changes the result of timber harvest activities are not analyzed in this document as these fuels will be treated following the harvest. Resultant short term models that the timber slash fall into are fuel models 11 and 12. Inputs for the comparison are typical of summer fire season conditions and were adjusted to show the more open fuel models 8 and 6 under dryer conditions as identified with the following fire behavior inputs and outputs obtained.

**Table 3-8: Fuel Model / Fire Behavior Modeling**

| **Model Inputs** | Fuel Model 10 | Fuel Model 9 | Fuel Model 8 | Fuel Model 4 | Fuel Model 6 |
|---|---|---|---|---|---|
| 1-hr Moisture | 5 | 5 | 4 | 5 | 4 |
| 10-hr Moisture | 8 | 8 | 7 | 8 | 7 |
| 100-hr Moisture | 10 | 10 | 9 | 10 | 9 |
| Live Woody Moisture | 100 | N/A | N/A | 100 | N/A |
| Midflame Wind Speed | 5 | 5 | 6 | 5 | 6 |
| Slope Steepness | 40 | 40 | 40 | 40 | 40 |
| | | | | | |
| **Model Outputs** | Fuel Model 10 | Fuel Model 9 | Fuel Model 8 | Fuel Model 4 | Fuel Model 6 |
| Rate of Spread (max) | 11.2 | 11.9 | 3.7 | 97.4 | 60.1 |

| | | | | | |
|---|---|---|---|---|---|
| Heat per Unit Area | 1315 | 390 | 209 | 2687 | 519 |
| Fireline Intensity | 270 | 85 | 14 | 4797 | 571 |
| Flame Length | 5.9 | 3.5 | 1.5 | 22.2 | 8.3 |

Crown Fire Behavior Modeling - A number of fuel reduction scenarios were modeled using the Fuels Management Analyst PLUS software to look at crown fire initiation based on crown bulk density and crown base height levels in fuel model 9. In general terms, the current stand structure and a 20% reduction in the canopy would allow for crown fire initiation with mid-flame windspeeds of 1.5 mph. A 40% reduction in the canopy would require a mid-flame windspeed of 6 mph for crown fire initiation. Crown fire activity would move from passive to active crown fire at mid-flame windspeeds of 8 mph for the current stand and 11 mph for a stand with a 20% reduction in the canopy. With a 70% reduction in the small diameter understory, the crown base height would need to be below 20' under a 12 mph mid-flame windspeed for crown fire initiation. When the above scenarios were modeled using fuel model 8, crown fire initiation did not occur.

**Fire risk** in the project area is high due to the level of residential development and recreational use in the area and the high level of risk of human-caused fire ignition. Lightning occurrence is moderate to high. The area typically experiences at least one lightning storm event every 2 – 3 summers with multiple wildfires resulting. Fire occurrence in the West Fork Illinois watershed for the last 34 years is summarized in Table 3-9.

**Table 3-9: Historic Fire Occurrence 1970-1998**

| Cause | Total Number of Fires | Percentage of Fires | Yearly Average Number of Fires | Total Acres | Average Fire Size (acres) | Yearly Average Fire (acres) |
|---|---|---|---|---|---|---|
| Human | 270 | 83% | 9.6 | 501 | 1.9 | 17.9 |
| Lightning | 54 | 17% | 1.9 | 262 | 4.8 | 9.3 |
| Total | 324 | 100% | 11.6 | 763 | 2.4 | 27.3 |

**Values at risk** reflect the resource and human values in an area. A majority (76%) of the project area is in the high and moderate values at risk category. This is due the residential, wildlife, recreational, and other forest resource values. Approximately 40% of the project area falls within the Illinois Valley designated Community at Risk (CAR). This includes locations with wildland/urban interface near O'Brien, Takilma, and the Waldo and Logan Cut Roads. Approximately 40% falls within the 1½ mile buffer to the Communities at Risk. The remainder, approximately 20%, is outside of any CAR.

**Table 3-10: WUI vs CAR Acres**

| Designation | Total Acres | BLM | | Private | |
|---|---|---|---|---|---|
| | | Acres | % of Total Acres | Acres | % of Total Acres |
| WUI | 9,611 | 2,275 | 24% | 7,336 | 74% |
| CAR | 4,472 | 1,079 | 24% | 3,393 | 74% |

Source: Derived from GIS, Medford District BLM

### 3) Air Quality

Air quality in the Illinois Valley is good with limited local emission sources and in general, good wind dispersion. Existing sources of emissions include occasional construction and logging equipment,

light industrial, vehicles, road dust, residential wood burning, campfire burning, and smoke from prescribed fire. Emissions are limited with greatest impact caused during times of heavy wildfire activity within the region, usually in the late summer. Temperature inversions commonly develop in the Illinois Valley throughout the winter months and occasionally during the late summer months trapping smoke and reducing smoke dispersal.
Grants Pass and Medford are the closest designated air quality non-attainment area. Grants Pass is classified as a non-attainment area for fine particulate (PM10) and carbon monoxide standards. The Kalmiopsis Wilderness is a Class I area 15 miles to the northwest of the project area.

b. Environmental consequences

1) Alternative 1: No Action

a) Hazard, Risk, Values at Risk and Priority Treatment Areas

Alternative 1 would see the continuation of the current fire exclusion, rapid wildfire suppression with a "smallest possible size" (94% less than 10 acres) objective, and minimal fuel reduction treatments largely limited to around structures. Fuel hazard would remain high as vegetation and fuel conditions would continue to develop on current successional trajectories. These conditions have a high potential for large and catastrophic fires to occur. Increases in both the vertical (ladder fuels) and horizontal structure (dead and down material) would continue. The potential for crown fires would continue to increase. Many areas could experience stand destroying wildfires. Table 3-11 projects the fuel hazard levels in the project area.

**Table 3-11: Hazard Classification**

| Time period | Total Acres | High Hazard | | Moderate Hazard | | Low Hazard | |
|---|---|---|---|---|---|---|---|
| | | Acres | % of Total | Acres | % of Total | Acres | % of Total |
| BLM – Current * | 5,643 | 2,135 | 38% | 2972 | 53% | 536 | 10% |
| 5-10 Years | 5,643 | 2,729 | 48% | 2485 | 44% | 429 | 8% |
| 10-20 Years | 5,643 | 3,723 | 66% | 1662 | 29% | 257 | 5% |

Projections are based on the assumption of 20% acreage increase in the high hazard for the first 5-10 years and an additional 40% for the next 10 – 20 years.

** Source: West Fork Illinois Watershed Analysis (USDI 2000)*

As the acreage of high fuel hazard increase, the potential for large catastrophic wildland fire increases. Initial attack suppression goals would be to hold new fire starts to 10 acres or less, however, the potential for a fire start to develop into a large fire would continue to increase. Fire suppression tactics and strategies may have to be altered from the desired direct attack methods to more indirect methods to provide for fire fighter and public safety. This would result in larger fire sizes. Fires larger than 100 acres could result with burn severities similar to the Biscuit Fire: 30 - 40% with moderate to high severity, and upwards of 50% of the area with 75 - 100% canopy mortality.

| Table 3-12: Biscuit Fire Burn Severity Class | | | | | |
|---|---|---|---|---|---|
| Burn Severity | High | Moderate | Low | Unburned / Very Low | Total |
| Total Acres | 78,870 | 114,376 | 206,564 | 100,786 | 500,596 |
| Percent of Total | 16% | 23% | 41% | 20% | 100% |

2) Alternatives 2 and 3

a) Hazard, Risk, Values at Risk and Priority Treatment Areas

Alternatives 2 and 3 will reduce fire hazard to varying degrees and to different spatial extents.

Table 3-13 summarizes the generalized effects of surface fuel, canopy base height, canopy bulk density treatments, and retention of larger fire resistant trees. Table 3-14 provides a generalized summary comparing alternatives and how they would alter these three parameters.

| Table 3-13: Fire Treatment and Resultant Impacts * | | | |
|---|---|---|---|
| Treatment | Effect | Advantage | Concerns |
| Surface fuels reduction | Reduces potential flame length | Provides for safer and easier control while reducing torching | Surface disturbance, less with prescribed fire than other techniques |
| Increase canopy base height | Requires longer flame length to begin torching | Reduce opportunity for fire to get into and become crown fire | Opens understory and may allow increase in mid-flame wind speed |
| Reduce canopy bulk density | Reduces probability of active and independent crown fire | Reduces crown fire potential | Wind speeds may increase and fuels may dry faster |
| Retain larger fire resistant trees | Maintains trees with thicker bark and taller crowns | Increases survivability of residual trees | Removal of smaller diameter trees and no large diameter trees is economically less viable. |

* Modified from Agee (2002)

| Table 3-14: Fuel Treatment Comparison by Alternative | | | |
|---|---|---|---|
| Element | **Alternative 1** | **Alternative 2** | **Alternative 3** |
| Surface fuels reduction | Fuels would increase based on successional pathways | Fuels would be reduced at the highest level of treatment (potential treatment of 2,709 acres) | Fuels would be reduced, but at a lower level (potential treatment of 1,585 acres) |
| Increase canopy base height | Canopy base height would decrease as suppressed regeneration and ladder fuels follow successional pathways | Canopy base height would increase within both the surface fuels and some treatment of the overstory canopy | Limited treatment of canopy base height will occur, primarily through the reduction of surface fuels |
| Reduce canopy bulk density | Many areas are at maximum, but small short term reduction could occur as trees in the overstory die out | The greatest level of reduction would occur within timber harvest units in conjunction with fuel treatment units. | A lesser level of reduction would occur. Level of active crown fire behavior would be reduced, especially in harvest and fuels units, but under extreme conditions, would provide limited reduction in crown fire behavior |
| Retain larger fire resistant trees | Potential to loose large trees due to stress and other disturbance factors | Protection of larger trees would occur from surface fire effects, but potential to lose from crown fire | Protection of larger trees would occur from surface fire and from limits on active crown fire, but not passive torching |

Estimated potential acres of treatment for Alternatives 2 and 3 are summarized in Table 3-15 based on the three hazard rating classes. Treatment levels are based on the description of alternatives (Table B-1, B-2) and the percent of the project area proposed for understory fuel reduction treatment.

Alternative 2 would treat 49% of the BLM lands in the watershed and initially reduce the high hazard acreage from 23% to 1% with a corresponding increase in low hazard acres from approximately 1% to 34% of the BLM land in the watershed. Alternative 3 would treat 22% of the BLM lands in the watershed and initially reduce the high hazard acres from 14% to approximately 0% with a corresponding increase of low hazard acres from 0 to 9%.

The hazard change projections are based on the following assumptions: Treatments in early to mid seral stands would be reduced to a moderate hazard level. Wildlife habitat restoration units would be reduced by one hazard level. Mature stands with understory thinning, followed with hand pile, hand pile burning, or Slashbuster either of which is followed-up with underburning is reduced by two hazard levels.

For the analysis shown below Table 3-15, it is assumed that the longest time interval before new management activity would be prescribed is 20 years. For the 10-20 year time period, it is assumed that 90% of the treated acres would be maintained at the same hazard level and the remaining 10% would follow the trajectory identified in the no action alternative for a change in individual acreage per classification at a rate of 40%.

**Table 3-15 Post Treatment Hazard Conditions (estimated)**

| | Alternative | BLM Acres | High Hazard | | Moderate Hazard | | Low Hazard | |
|---|---|---|---|---|---|---|---|---|
| | | | Acres (est) | % of Total BLM (5,644 ac) | Acres (est) | % of Total BLM (5,644 ac) | Acres (est) | % of Total BLM (5,644 ac) |
| **Current Hazard** | | 5,644 | 2,135 | 38% | 2,972 | 53% | 536 | 10% |
| | | | | | | | | |
| **Acres treated** | **Alternative 2** | 2,759 | 1320 | 23% | 1384 | 25% | 55 | 1% |
| Post Treatment hazard | 0-5 yrs | 2759 | 65 | 1% | 782 | 14% | 1,912 | 34% |
| | 5-10 Years | 2,759 | 161 | 3% | 1035 | 18% | 1563 | 28% |
| | 10-20 Years | 2,759 | 575 | 10% | 1248 | 22% | 935 | 17% |
| | | | | | | | | |
| **Acres treated** | **Alternative 3** | 1,248 | 811 | 14% | 437 | 8% | 0 | 0% |
| Post treatment hazard | 0-5 yrs | 1,248 | 25 | 0% | 724 | 13% | 499 | 9% |
| | 5-10 Years | 1,248 | 150 | 3% | 697 | 12% | 401 | 7% |
| | 10-20 Years | 1,248 | 412 | 7% | 574 | 10% | 262 | 5% |

b) Air Quality

The principal impact to air quality is expected to be the temporary visibility impairment caused by smoke from wildland and prescribed fires. Potential short duration (single day to several weeks) and long duration, high level PM 10 and PM 2.5 emissions would be expected from major wildfire events within the local area or region. Prescribed burning emissions would not be expected to exceed standards. If standards were exceeded they would most likely be highly localized and several hours in duration.

Wildfires have the potential to emit large quantities of smoke over long periods of time and at

uncontrollable times or levels. Whereas, prescribed fire will produce smoke, through appropriate smoke management measures, the quantities, duration, and timing of the burn can be adjusted to manage such production.

Alternative 1 would have the lowest level of smoke from prescribed burning activities, yet have the greatest potential for large scale smoke events from wildfires. Alternatives 2 would have the highest amount of smoke produced from prescribed burning, yet over time, lower levels resulting from wildfire events. Alternative 3 would have an increased amount of smoke produced from prescribed burning, yet over time, reduced levels resulting from wildfire events.

c. Cumulative Effects

1) Alternative 1

The no action alternative allows the continuation of hazardous fuels build up and increases the potential for large scale, catastrophic fire. Wildland fire fighters and the local public would be at greater risk for loss of life and property in the event of a large scale fire. The impacts of such an event on visual, wildlife, and forest conditions would be extreme. A high percentage of acres would burn at high intensities.

2 Alternatives 2 and 3

The proposed fire hazard reduction treatments would return a large portion of the project area to near its historical ranges of fuel loadings, canopy base height and canopy bulk densities. This would result in a substantial reduction to the fire hazard, risk and values at risk within the project area and compliments several other fuel reduction projects (including Free and Easy and 3 + 3) that are currently being implemented within the watershed. When wildfire occurs the potential effects would include a mosiac of fire intensities with a large percentage of these acres being at the low to moderate levels. Wildland firefighter and public safety would be greatly increased and direct strategies and tactics could be utilized to control the fire resulting in fewer acres burned and less threat to private property.

d. Summary and Conclusions

Activities associated with the proposed action will not eliminate all wildfire but will rather provide for more fire-resilient forests whose characteristics allow for a higher level of survival from wildland fire. The activities that create the fire-resilient forests will also provide for greater ease and safety of the fire suppression.

### 3.2.8. Resource: Visual Resource Management (VRM)

a. Affected Environment

Current human uses within the project area include dispersed recreation activities, resource management, some recreational mining, harvest of forest products, and non-consumptive uses. People of various economic backgrounds live within or adjacent to the project areas and include small

business owners, ranchers, mill workers, rural residents who commute between their residences and Grants Pass, artists, retirees, and those engaged in non-ranch agriculture and farming.

The RMP designates the entire West Fork Illinois project area as VRM Class III. Objectives for VRM class III lands are to "partially retain the existing character of the landscape. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape (BLM Manual, 1986).

b. Environmental Consequences

1) Alternative 1: No Action

There would be no appreciable visual alterations of the landscape. Class III VRM objectives would continue to be met.

2) Alternatives 2 and 3

The visual effect on the recreation experience may be slightly more open as a result of forest management activities. Some openings may be visible from roads, including Waldo Road, but the activities will conform to the objectives of VRM III lands. Class III VRM objectives would continue to be met.

# 4.0 Agencies and Persons Consulted

## 4.1 Public Involvement

Public scoping for the West Fork Illinois Landscape Management Project was initiated in June 1999, when the Forest Service and the BLM announced that the two agencies were planning to jointly prepare an EIS for public lands in the East and West Forks of the Illinois River. The project at that time was called the Upper Illinois River Landscape Management Project, and as mentioned, it included public lands in both East Fork and West Fork. BLM mailed out over 240 letters to adjacent landowners and others who have asked to be kept informed about upcoming BLM projects. Approximately 300 letters were received. Most of the comments received were specific to lands in the East Fork, particularly to lands that residents commonly refer to as the "Takilma Forest". Very few of the comments that BLM received referred specifically to BLM lands in the West Fork of the Illinois watershed. The comments were grouped into broad categories for analysis by the planning team.

In March 2001, a letter went out to the public notifying them of BLM's intent to split the Upper Illinois River Landscape Management Project into two projects along watershed lines. A primary reason for splitting them at the time was due to some delay in completing the East Fork Illinois Watershed Analysis 2.0. Thus, the West Fork Illinois Landscape Management Project was initiated. In that letter, BLM identified their intent to analyze the West Fork project and its effects in an environmental analysis (EA) rather than an EIS.

## 4.2 Agencies and Persons Consulted

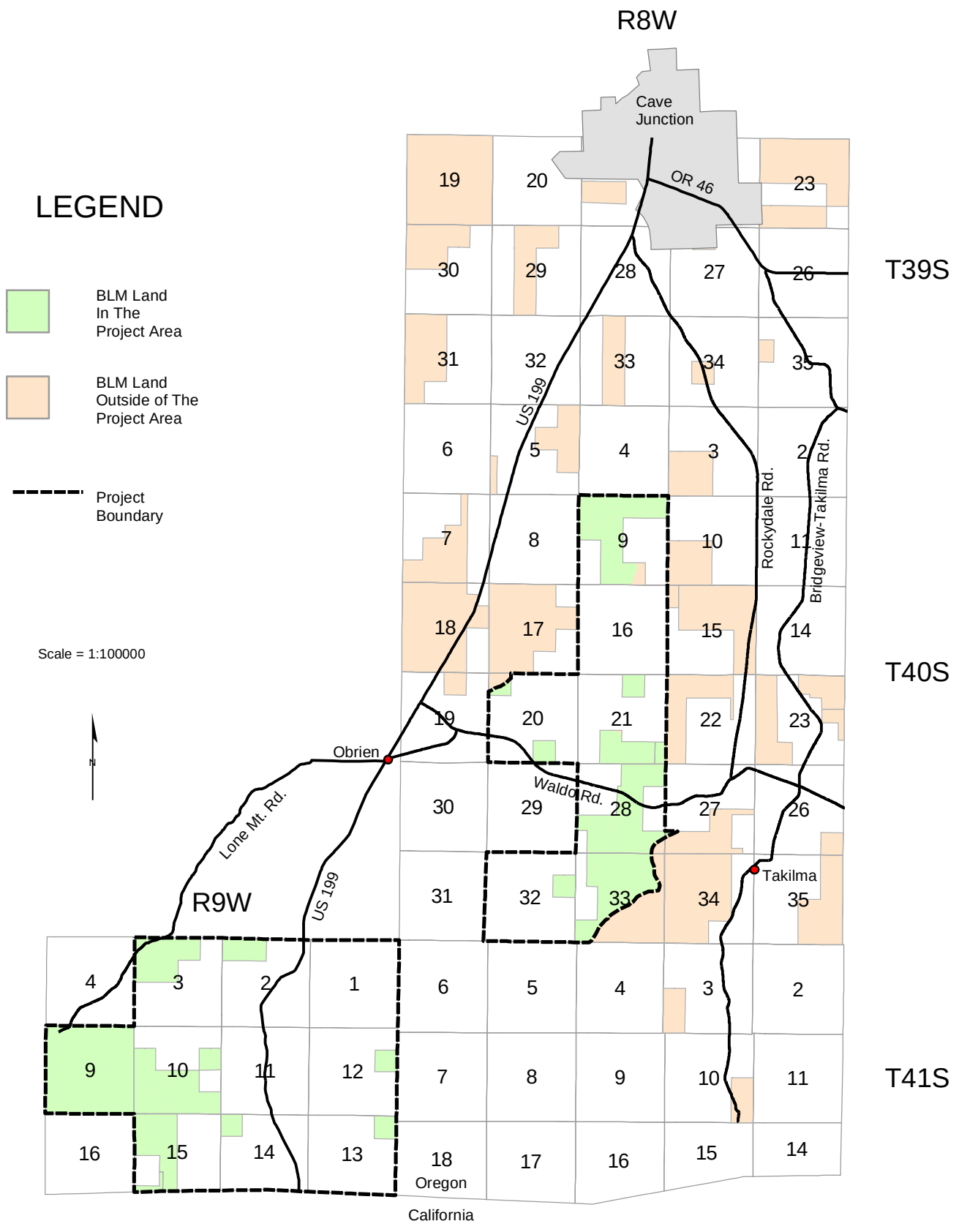
Given the mixed federal ownership Illinois valley, the BLM and USFS worked closely together on the watershed and effects analysis, collaborating on the preparation of documents. Additionally, given the rich history of the Waldo-Takilma mining district, the State Historic Preservation Office was frequently consulted during the planning process.

## 4.3 Availability of Document and Comment Procedures

Copies of the EA document will be available for formal public review in the BLM Medford District Office. The EA will also be posted on the Medford District's website (*www.or.blm.gov/Medford*). A formal 30 day public comment period will be initiated by an announcement of the EA's availability in the Grants Pass Daily Courier newspaper

An announcement of the EA's availability will be placed in the legal ads in the Grants Pass *Daily Courier* newspaper. Publication of this notice will start the 30 day comment period. Written comments should be sent to Abbie Jossie, Field Manager, Grants Pass Resource Area, BLM, 3040 Biddle Road, Medford, OR 97504.

# APPENDIX A: MAPS



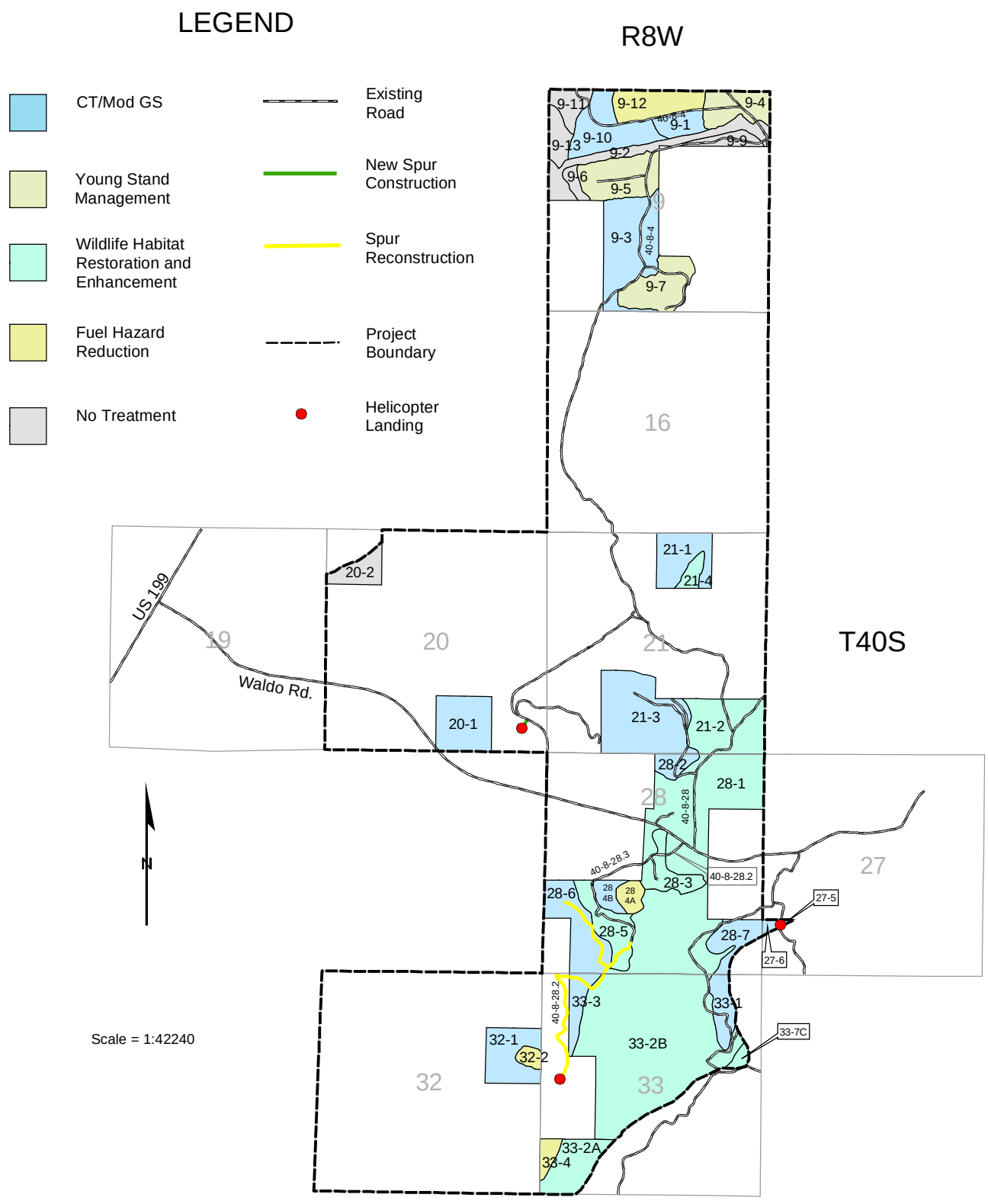

# West Fork Illinois River Landscape Management Project
## Map 1 - Vicinity

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT



John McGlothlin

June, 2004




# West Fork Illinois River Landscape Management Project
## Map 2a - Alternative 2

U.S. DEPARTMENT OF THE INTERIOR
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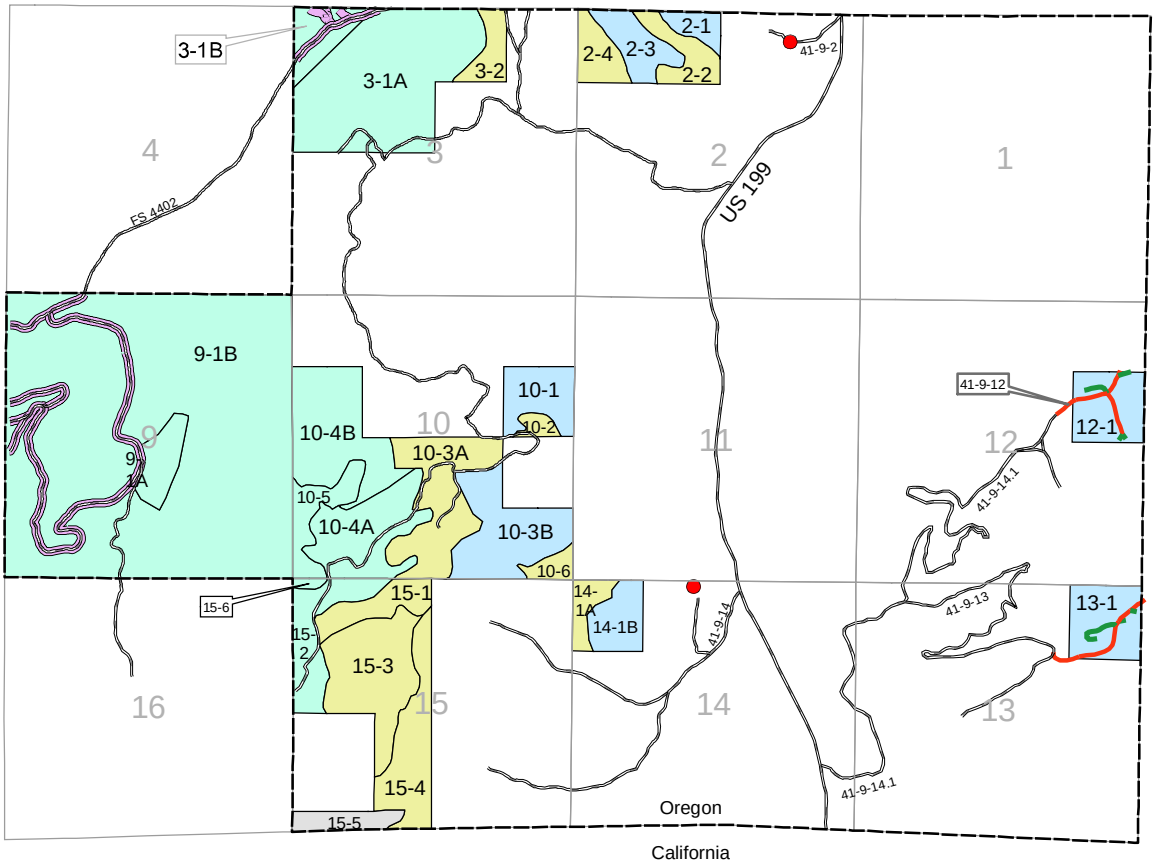
June, 2004

R9W




T41S

# West Illinois River Landscape Management Project
# Map 2b - Alternative 2

## LEGEND

- CT/Mod GS
- Wildlife Habitat Restoration and Enhancement
- Fuel Hazard Reduction
- No Treatment
- POC Sanitation
- Existing Road
- New Road Construction
- New Spur Construction
- Project Boundary
- Helicopter Landing

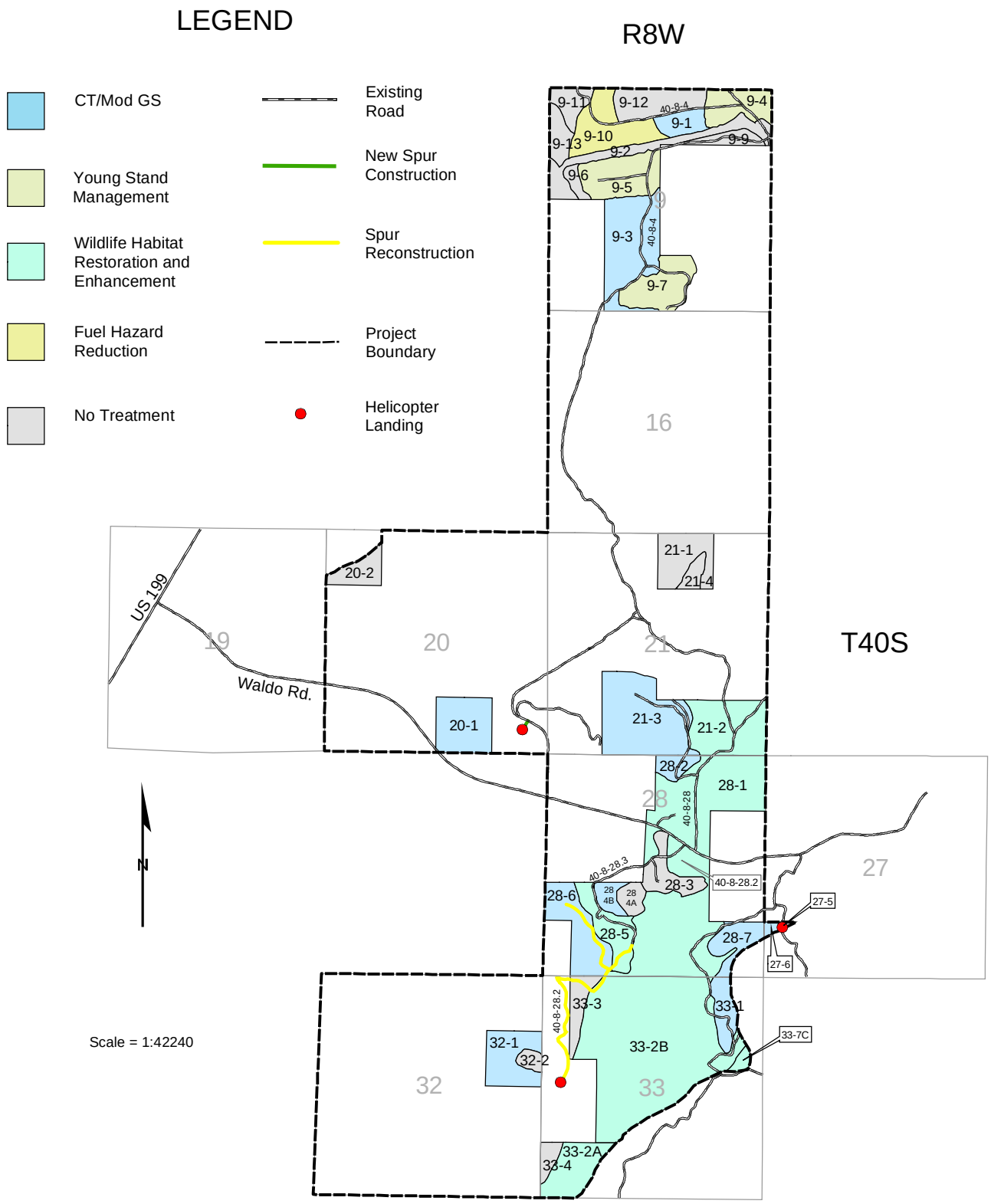
N

Scale = 1:42240



John McGlothlin

June, 2004




# West Fork Illinois River Landscape Management Project
## Map 3a - Alternative 3

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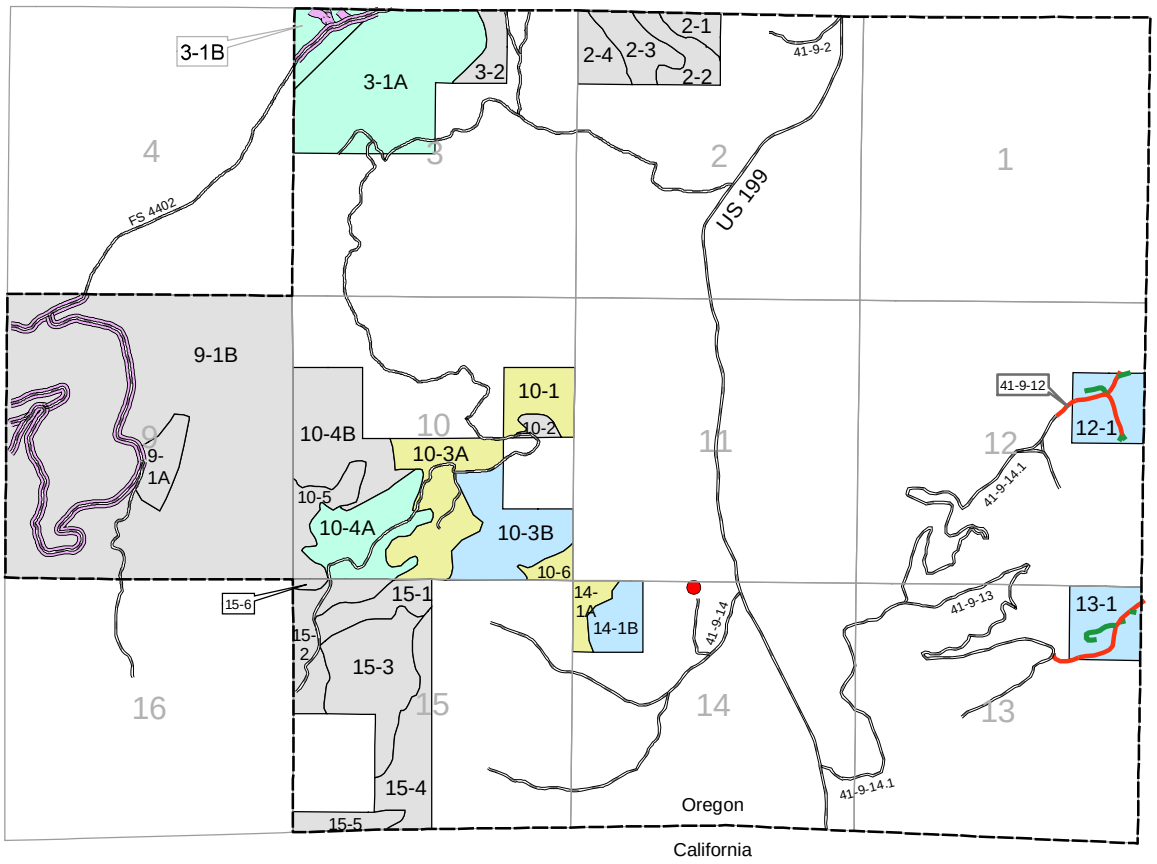
R9W




T41S

# West Illinois River Landscape Management Project
# Map 3b - Alternative 3

## LEGEND

- CT/Mod GS
- Wildlife Habitat Restoration and Enhancement
- Fuel Hazard Reduction
- No Treatment
- POC Sanitation
- Existing Road
- New Road Construction
- New Spur Construction
- Project Boundary
- Helicopter Landing

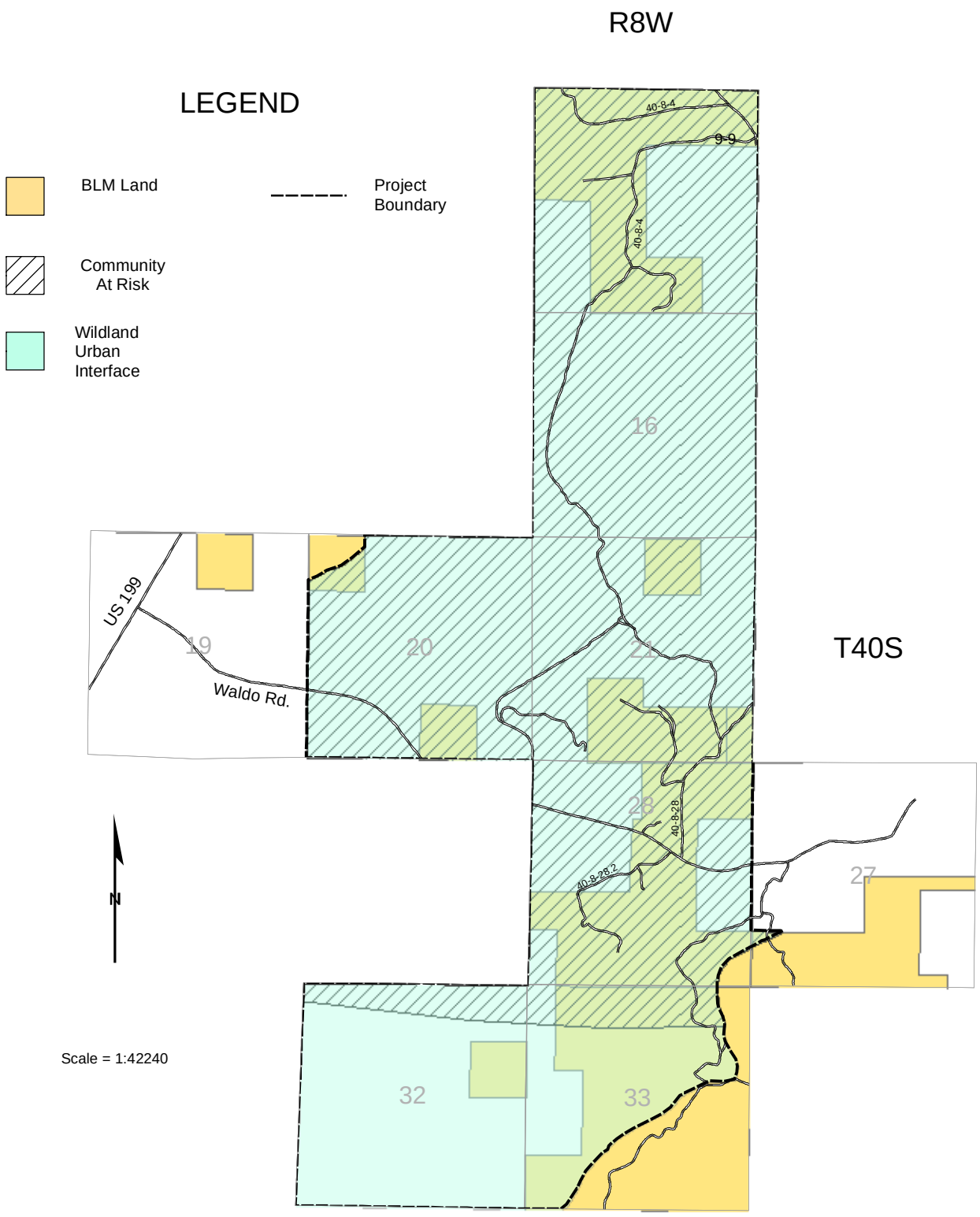
N

Scale = 1:42240



John McGlothlin

June, 2004




# Map 4a

## West Fork Illinois River Landscape Management Project
## Communities At Risk and Wildland Urban-Interface

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT



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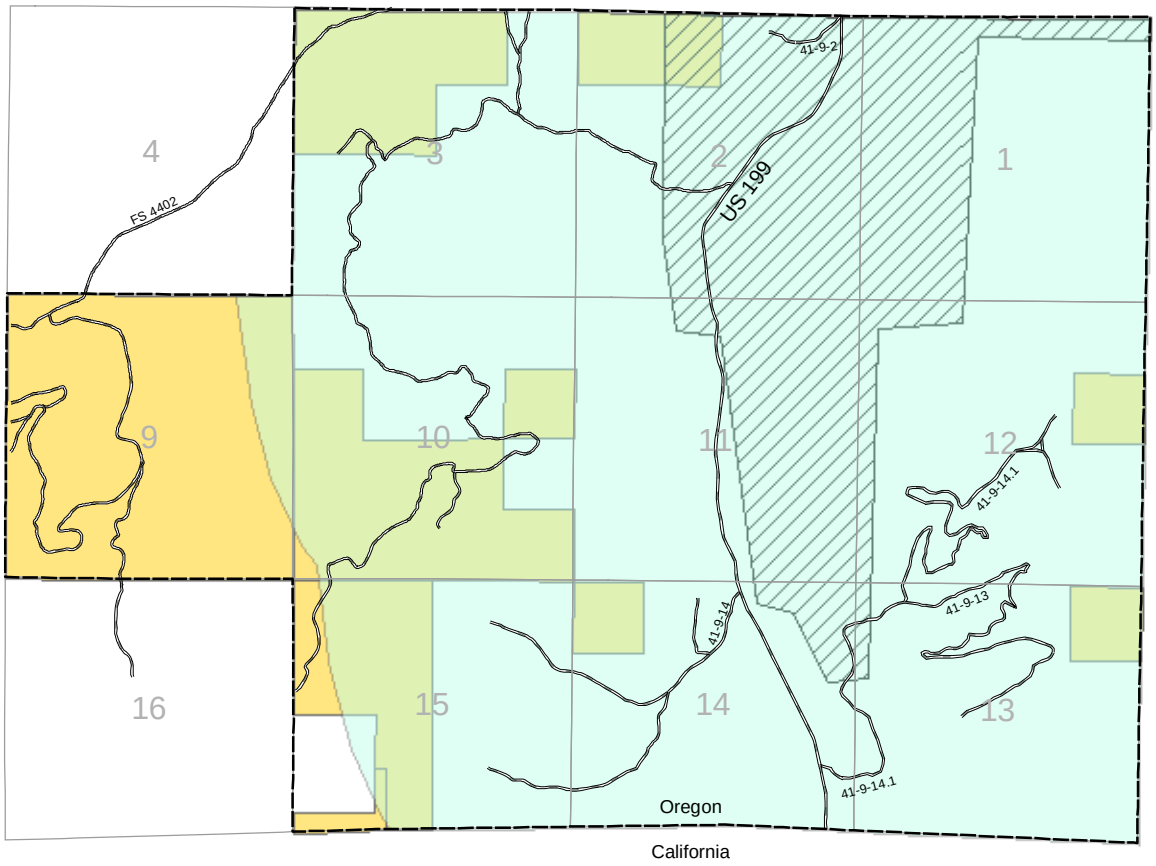
June, 2004

R9W




T41S

Map 4b

West Illinois River Landscape Management Project
Communities At Risk and Wildland-Urban Interface

LEGEND

BLM Land

Project Boundary

Community At Risk

Wildland Urban Interface

N

Scale = 1:42240



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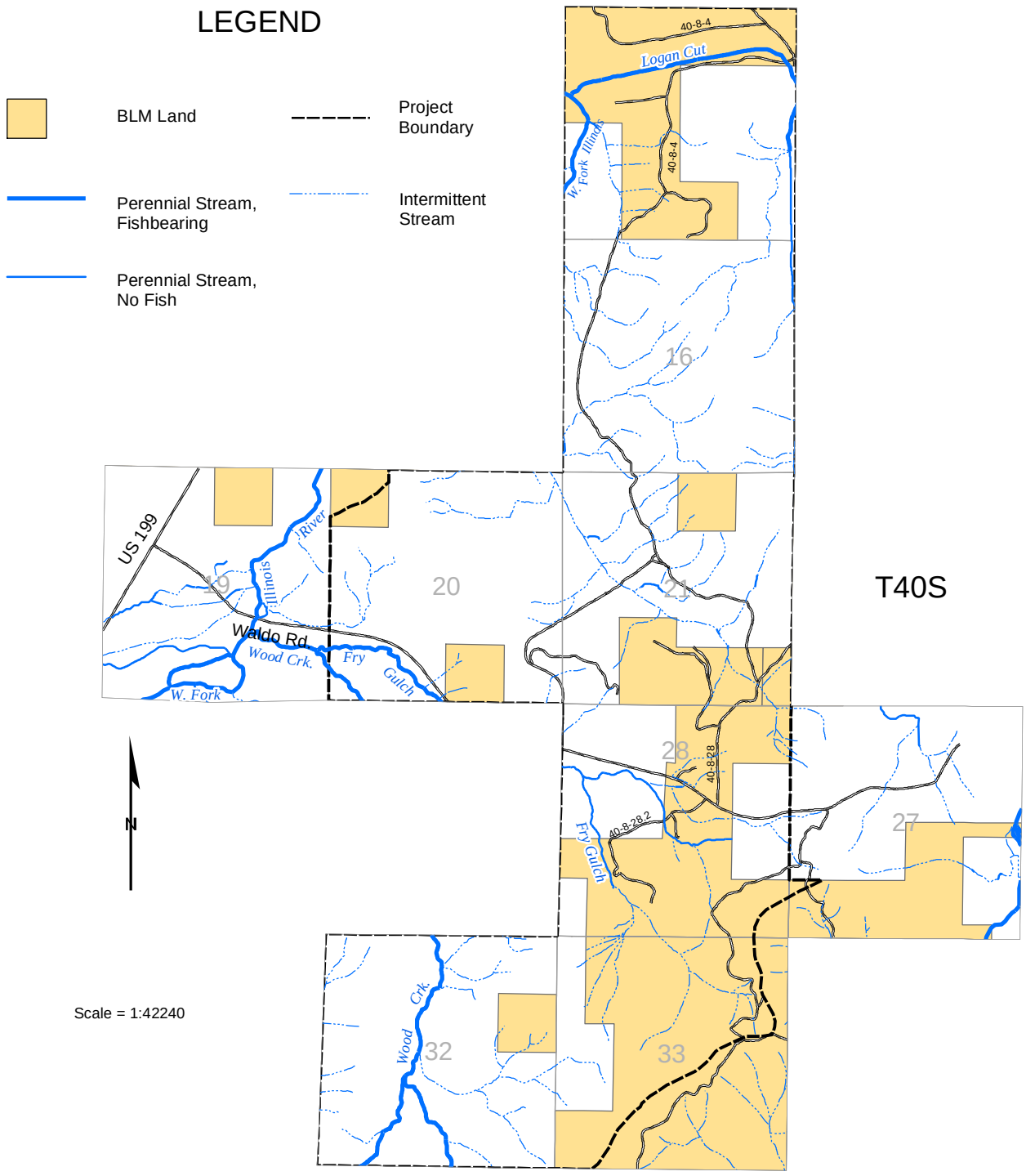
June, 2004

R8W




Map 5a

West Fork Illinois River Landscape Management Project
Fish Presence and Stream Flow

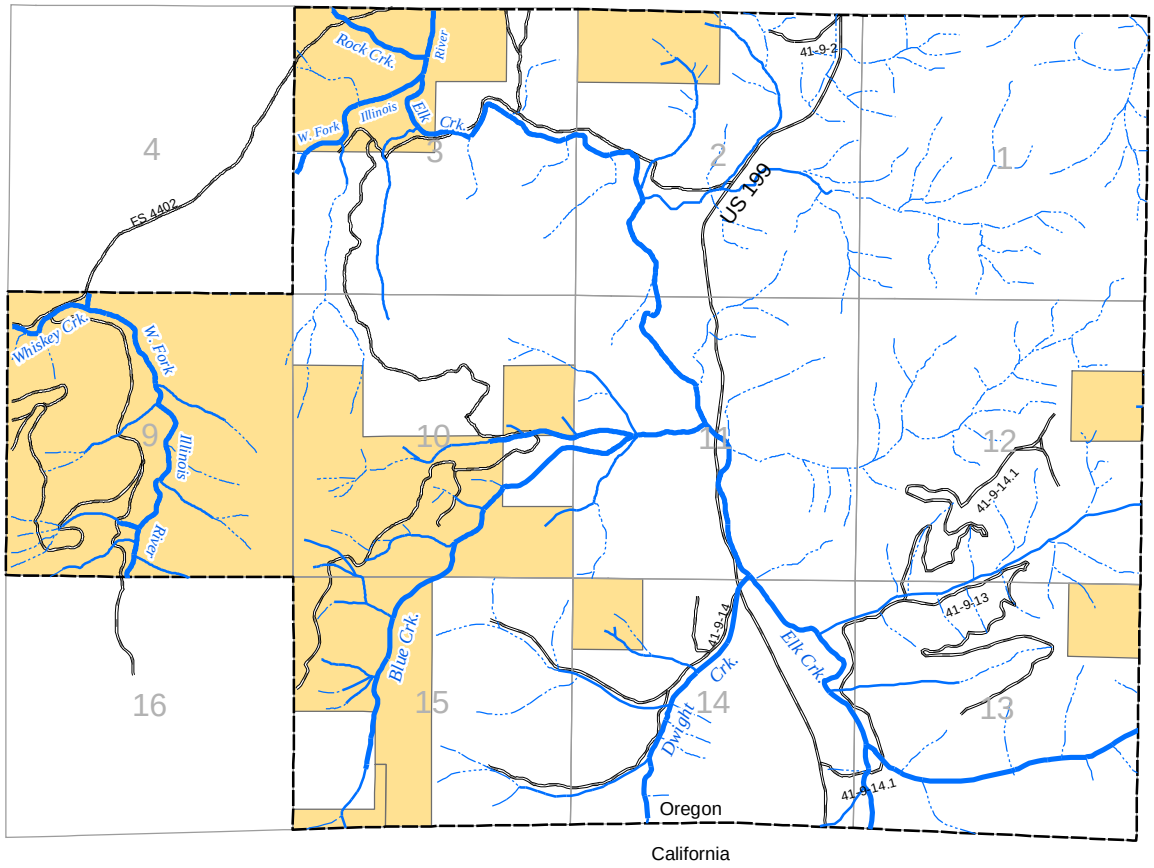
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT



John McGlothlin

June, 2004

R9W




T41S

Map 5b

# West Illinois River Landscape Management Project
# Fish Presence and Stream Flow

## LEGEND

- BLM Land
- Project Boundary
- Perennial Stream, Fishbearing
- Intermittent Stream
- Perennial Stream, No Fish

N

Scale = 1:42240



John McGlothlin

June, 2004

# APPENDIX B: PROPOSED VEGETATION TREATMENTS

## Table B-1: Summary Description of the Proposed Action -Alternative 2

| | | | | | | | | | | | | -------- Estimated Harvest Volumes (MBF)---------- | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Matrix | | Riparian | | | | |
| T-R-S-OI# | Project Unit # | Land Alloc | TPCC | Unit Acres | Seral Stage Current | Seral Stage Post | Plant Series | Vegetation Treatment | Fuels Treatment-Understory Treatment | Logging System | Estimated Total Unit Vol | Acres | Vol/ Acre | Acres | Vol\ Acre | Total Unit | Non Harvest Treatment Acres Matrix | Non Harvest Treatment Acres Riparian | Comments |
| 40-8-9-001 | 9-1 | Matrix/ Riparian | RTR | 14 | Mature | Mature | TO | CT/MGS | UT / UB / SB | T | 972 | 9 | 10 | 5 | 7 | 125 | | | |
| 40-8-9-002 | 9-2 | Matrix/ Riparian | NW | 36 | Mature | Mature | DF | None | None | | | | | | | | | | |
| 40-8-9-003 | 9-3 | Matrix/ Riparian | RTR | 68 | Early/ Mature | Early/ Mature | TO/DF /WO | CT/MGS | UT / HP / UB / SB | T | 1360 | 43 | 6 | 25 | 4 | 358 | | | |
| 40-8-9-004 | 9-4 | Matrix/ Riparian | RTR | 28 | Early | Early | TO | Young Stand Mgt | SL / HP / SB | | | | | | | | 25 | 3 | |
| 40-8-9-005 | 9-5 | Matrix/ Riparian | RTR | 42 | Early | Early | TO | Young Stand Mgt | SL / HP / SB | | | | | | | | 34 | 8 | |
| 40-8-9-006 | 9-6 | Matrix/ Riparian | RTR | 6 | Mature | Mature | DF | None | None | | | | | | | | | | |
| 40-8-9-007 | 9-7 | Matrix/ Riparian | RMR | 37 | Early | Early | TO | Young Stand Mgt | SL / HP / SB | | | | | | | | 36 | 1 | |
| 40-8-9-009 | 9-9 | Matrix/ Riparian | RTR | 11 | Mature | Mature | DF | None | None | | | | | | | | | | |
| 40-8-9-010 | 9-10 | Matrix/ Riparian | RTR | 44 | Mature | Mature | TO | CT/MGS | UT / UB / HP / SB | T | 1390 | 32 | 10 | 12 | 6 | 392 | | | |
| 40-8-9-011 | 9-11 | Matrix/ Riparian | RTR | 14 | Mature | Mature | TO | None | None | | | | | | | | | | |
| 40-8-9-012 | 9-12 | Matrix | RTR | 32 | Mature | Mature | DF | Fuel Haz Reduction | SL / UB / HP / SB | | | | | | | | 32 | | |
| 40-8-9-013 | 9-13 | Matrix/ Riparian | RTR | 13 | Mature | Mature | DF | None | None | | | | | | | | | | |
| 40-8-20-001 | 20-1 | Matrix/ Riparian | RTR | 41 | Mature | Mature | DF | CT/MGS | UT / HP / UB | T/H | 1258 | 36 | 8 | 5 | 4 | 308 | | | |
| 40-8-20-002 | 20-2 | Matrix | LSW | 18 | | | NF | None | None | | | | | | | | | | |
| 40-8-21-001 | 21-1 | Matrix/ Riparian | RTR | 33 | Mature | Mature | DF | CT/MGS | UT / HP / UB | T/H | 510 | 28 | 5 | 5 | 3 | 155 | | | |
| 40-8-21-002 | 21-2 | Matrix/ Riparian | LSW | 55 | | | JP/ WO | Wildlife Hab Rest | SL / HP / UB | | | | | | | | 42 | 13 | |
| 40-8-21-003 | 21-3 | Matrix/ Riparian | RTR | 83 | Mature | Mature | TO | CT/MGS | UT / HP / UB | T | 2905 | 75 | 10 | 8 | 5 | 790 | | | |
| 40-8-21-004 | 21-4 | Matrix/ Riparian | LSW | 7 | | | WO | Wildlife Hab Rest | SL / HP / UB | | | | | | | | 7 | 0 | |
| 40-8-27-005 | 27-5 | Matrix/ Riparian | RTW | 1 | Mature | Mature | DF | None | None | | | | | | | | | | |

## *Table B-1: Summary Description of the Proposed Action -Alternative 2 (cont'd)*

| | | | | | | | | | | | | Estimated Harvest Volumes (MBF) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Matrix | | Riparian | | | | | |
| T-R-S-OI# | Project Unit # | Land Alloc | TPCC | Unit Acres | Seral Stage Current | Seral Stage Post | Plant Series | Vegetation Treatment | Fuels Treatment-Understory Treatment | Logging System | Estimated Total Unit Vol | Acres | Vol/ Acre | Acres | Vol\ Acre | Total Unit | Non Harvest Treatment Acres Matrix | Non Harvest Treatment Acres Riparian | Comments |
| 40-8-27-006 | 27-6 | Matrix | RTR | 2 | Mature | Mature | DF | CT/MGS | UT / HP / UB | T/C | 100 | 2 | 10 | | | 20 | | | |
| 40-8-28-001 | 28-1 | Matrix/ Riparian | LSW | 208 | | | JP/ WO | Wildlife Hab Rest | SL / HP/ UB / SB | | | | | | | | 171 | 37 | |
| 40-8-28-002 | 28-2 | Matrix/ Riparian | RTR/ RMR | 11 | Mature | Mature | TO | CT/MGS | UT / UB / HP / SB | T | 210 | 11 | 10 | 1 | 5 | 115 | | | |
| 40-8-28-003 | 28-3 | Matrix | NR | 23 | | | JP | Wildlife Hab Rest | SB / UB | | | | | | | | 23 | 0 | |
| 40-8-28-004 | 28-4A | Matrix | RTR | 9 | Mid/ Mature | Mid/ Mature | DF/TO | Fuel Haz Reduction | SL / UB / HP | | | | | | | | 9 | 0 | Waldo and Chinese Cemeteries |
| 40-8-28-004 | 28-4B | Matrix | RTR | 10 | Mid/ Mature | Mid/ Mature | DF/TO | CT/MGS | UT / HP / UB / SB | T | 300 | 10 | 7 | | | 70 | | | |
| 40-8-28-005 | 28-5 | Matrix/ Riparian | NR | 29 | | | JP | Wildlife Hab Rest | SL / HP / UB / SB | | | | | | | | 13 | 16 | |
| 40-8-28-006 | 28-6 | Matrix/ Riparian | RMR | 44 | Mid/ Mature | Mid/ Mature | TO | CT/MGS | UT / HP / UB / SB | T | 1334 | 38 | 7 | 6 | 4 | 290 | | | |
| 40-8-28-007 | 28-7 | Matrix | RMR/ RTR | 21 | Mature | Mature | DF | CT/MGS | UT / HP / UB / SB | T/C/H | 1150 | 21 | 10 | | | 210 | | | |
| 40-8-32-001 | 32-1 | Matrix/ Riparian | RTR/ RMR | 35 | Mature | Mature | TO | CT/MGS | UT / HP / UB | T/C/H | 825 | 32 | 8 | 3 | 4 | 268 | | | |
| 40-8-32-002 | 32-2 | Matrix/ Riparian | LSW | 6 | | | G/S | Fuel Haz Reduction | SL / HP / UB | | | | | | | | 6 | 0 | |
| 40-8-33-001 | 33-1 | Matrix/ Riparian | RTR | 19 | Mature | Mature | DF | CT/MGS | UT / HP / UB | T/C/H | 208 | 17 | 6 | 2 | 4 | 110 | | | |
| 40-8-33-002 | 33-2A | Matrix | LSW | 33 | | | JP | Wildlife Hab Rest | BB / SB | | | | | | | | 33 | 0 | |
| 40-8-33-002 | 33-2B | Matrix/ Riparian | LSW | 234 | | | JP | Wildlife Hab Rest | BB / SB | | | | | | | | 194 | 40 | |
| 40-8-33-003 | 33-3 | Matrix/ Riparian | RMR | 15 | Mid/ Mature | Mid/ Mature | TO | CT/MGS | UT / HP / UB / SB | T/C | 435 | 9 | 10 | 6 | 5 | 120 | | | |
| 40-8-33-004 | 33-4 | Matrix | RMR | 7 | | | TO/DF | Fuel Haz Reduction | UB | | | | | | | | 7 | 0 | |
| 40-8-33-007 | 33-7C | Matrix | RMR | 4 | | | JP | Wildlife Hab Rest | BB / SB | | | | | | | | 4 | 0 | |
| 41-9-2-001 | 2-1 | Matrix/ Riparian | RMR | 10 | Mature | Mature | DF/TO | CT/MGS | UT / HP | H | 216 | 9 | 6 | 1 | 3 | 57 | | | |

## *Table B-1: Summary Description of the Proposed Action -Alternative 2 (cont'd)*

| T-R-S-OI# | Project Unit # | Land Alloc | TPCC | Unit Acres | Seral Stage Current | Seral Stage Post | Plant Series | Vegetation Treatment | Fuels Treatment-Understory Treatment | Logging System | Estimated Total Unit Vol | Estimated Harvest Volumes (MBF) Matrix Acres | Matrix Vol/ Acre | Riparian Acres | Riparian Vol\ Acre | Total Unit | Non Harvest Treatment Acres Matrix | Non Harvest Treatment Acres Riparian | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41-9-2-002 | 2-2 | Matrix/ Riparian | RTR | 23 | Early/ Mid | Early/ Mid | DF | Fuel Haz Reduction | SL / HP | | | | | | | | 19 | 4 | |
| 41-9-2-003 | 2-3 | Matrix/ Riparian | RTR | 26 | Mid/ Mature | Mid/ Mature | DF/TO | CT/MGS | UT / HP | H | 200 | 24 | 6 | 2 | 3 | 150 | | | |
| 41-9-2-004 | 2-4 | Matrix | RTW | 20 | | | G/S | Fuel Haz Reduction | HP / SL / UB | | | | | | | | 20 | 0 | |
| 41-9-3-001 | 3-1A | Matrix/ Riparian | LSW | 157 | | | JP | Wildlife Hab Rest | SL / HP / UB | | | | | | | | 67 | 90 | POC Roadside Sanitation |
| 41-9-3-001 | 3-1B | Matrix/ Riparian | LSW | 23 | | | JP | Wildlife Hab Rest | SL / UB / HP | | | | | | | | 15 | 8 | POC Roadside Sanitation |
| 41-9-3-002 | 3-2 | Matrix | RTR | 18 | | | TO/DF | Fuel Haz Reduction | SL / HP | | | | | | | | 18 | 0 | |
| 41-9-9-001 | 9-1A | Matrix/ Riparian | LSW | 22 | | | JP | Wildlife Hab Rest | SL / HP / UB | | | | | | | | 2 | 20 | POC Roadside Sanitation\Potential RNA |
| 41-9-9-001 | 9-1B | Matrix/ Riparian | LSW | 609 | | | JP | Wildlife Hab Rest | SL / UB / HP | | | | | | | | 493 | 116 | POC Roadside Sanitation\Potential RNA |
| 41-9-10-001 | 10-1 | Matrix/ Riparian | RMR/ RTR | 31 | Mature | Mature | TO | CT/MGS | UT / UB / HP | C/H | 825 | 25 | 8 | 6 | 4 | 224 | | | |
| 41-9-10-002 | 10-2 | Matrix/ Riparian | RTW | 7 | | | TO/DF | Fuel Haz Reduction | SL / UB / HP | | | | | | | | 0 | 7 | |
| 41-9-10-003 | 10-3A | Matrix/ Riparian | RTR/ RMR | 68 | Early/ Mid | Early/ Mid | TO | Fuel Haz Reduction | SL / HP / UB | | | | | | | | 31 | 37 | |
| 41-9-10-003 | 10-3B | Matrix/ Riparian | RMR/ RTR | 68 | Early/ Mature | Early/ Mature | TO | CT/MGS | UT / UB / HP | T/H | 1168 | 48 | 5 | 20 | 2 | 280 | | | |
| 41-9-10-004 | 10-4A | Matrix/ Riparian | LSW | 61 | | | JP | Wildlife Hab Rest | SL / UB / HP | | | | | | | | 58 | 3 | |
| 41-9-10-004 | 10-4B | Matrix/ Riparian | LSW | 79 | | | JP | Wildlife Hab Rest | SL / BB / HP | | | | | | | | 73 | 6 | |
| 41-9-10-005 | 10-5 | Matrix | FNR | 23 | | | JP | Wildlife Hab Rest | SL / HP / UB | | | | | | | | 21 | 2 | |
| 41-9-10-006 | 10-6 | Matrix | RTR | 10 | Early/ Mid | Early/ Mid | DF | Fuel Haz Reduction | SL / HP | | | | | | | | 10 | 0 | |
| 41-9-12-001 | 12-1 | Matrix/ Riparian | RMR/ RTR | 40 | Mature | Mature | TO | CT/MGS | UT / HP / UB | T/C/H | 1000 | 38 | 8 | 2 | 4 | 312 | | | |
| 41-9-13-001 | 13-1 | Matrix/ Riparian | RMR/ RTR | 40 | Mature | Mature | TO | CT/MGS | UT / HP / UB | T/C/H | 792 | 38 | 7 | 2 | 3 | 272 | | | |
| 41-9-14-001 | 14-1A | Matrix/ Riparian | RTR | 11 | Early/ Mid | Early/ Mid | TO | Fuel Haz Reduction | SL / UB / HP | | | | | | | | 10 | 1 | |

## *Table B-1: Summary Description of the Proposed Action -Alternative 2 (cont'd)*

| T-R-S-OI# | Project Unit # | Land Alloc | TPCC | Unit Acres | Seral Stage Current | Seral Stage Post | Plant Series | Vegetation Treatment | Fuels Treatment-Understory Treatment | Logging System | Estimated Total Unit Vol | Estimated Harvest Volumes (MBF) Matrix Acres | Matrix Vol/ Acre | Riparian Acres | Riparian Vol\ Acre | Total Unit | Non Harvest Treatment Acres Matrix | Non Harvest Treatment Acres Riparian | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41-9-14-001 | 14-1B | Matrix/ Riparian | RTR | 28 | Mature | Mature | TO | CT/MGS | UT / HP / UB | H | 280 | 24 | 3 | 4 | 1 | 76 | | | |
| 41-9-15-001 | 15-1 | Matrix/ Riparian | RMR | 30 | | | TO/DF | Fuel Haz Reduction | SL / HP / UB | | | | | | | | 15 | 15 | |
| 41-9-15-002 | 15-2 | Matrix/ Riparian | LSW | 35 | | | JP | Wildlife Hab Rest | SL / HP / UB | | | | | | | | 31 | 4 | |
| 41-9-15-003 | 15-3 | Matrix/ Riparian | RTW | 76 | | | TO/DF | Fuel Haz Reduction | SL / HP / UB | | | | | | | | 47 | 29 | |
| 41-9-15-004 | 15-4 | Matrix/ Riparian | FNR/ RTR | 48 | Early | Early | DF | Fuel Haz Reduction | SL / HP / UB | | | | | | | | 47 | 1 | |
| 41-9-15-005 | 15-5 | Matrix/ Riparian | FNR/ RTR | 17 | | | TO/DF | None | None | | | | | | | | | | |
| 41-9-15-006 | 15-6 | Matrix | FNR/ RTR | 2 | | | JP | Wildlife Hab Rest | SL / HP / UB | | | | | | | | 2 | 0 | |
| ***Total*** | | | | ***2875*** | | | | | | | ***17438*** | ***569*** | | ***115*** | | ***4702*** | | | |

***Footnotes:***

**Project Unit #, OI#,** Project unit number corresponds to BLM operations inventory number that represents an inventoried area of land / vegetation.

**TPCC** (Timber Productivity Capability Classification): RTR - regeneration restricted due to hot temperatures and low soil moisture; RMR- regeneration restricted due to low soil moisture. FNR-fragile nutrient restricted; LSW-low site withdrawn; RMW-restricted moisture withdrawn

**Stand Seral Stage:** **Early** - Vegetation is dominated by shrubs or conifers and hardwood trees in a seedling/ sapling size class (<5"DBH)

**Mid** - Vegetation is tree dominated. Trees at least small pole size (>4"DBH). Larger scattered trees may be present.

**Mature** - Forest has begun to differentiate into distinct canopy layers. Overstory dominant and codominant trees are conifers greater than 20" DBH; understory trees will be conifer-hardwood mix.

**Plant Community** - TO (Tanoak), DF (Douglas-fir), JP (Jeffery Pine), WO (White oak)

**Treatment Descriptions - Harvest Treatments**

**1. Silvicultural Prescription** CT - Commercial Thin (removal of commercial conifers from an even aged stand or patch to encourage growth of remaining trees), Mod GS – Modified Group Selection (harvest where a vigorous sugar or Ponderosa pine or non-tanoak hardwood is left and surrounding commercial and non-commercial conifers are removed), SR - Structural Retention (regeneration timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished), and SC - Stand Conversion (A process in which vegetation that currently dominates a site is removed and is replaced with a species that better meets timber management objectives).

**2. Harvest Acres** - These are gross acres and do not include buffers for plants, animals, etc. **Harvest acres vs. Unit acres:** The difference in these acreages is attributable to large variability within the unit, unit inclusions of riparian reserves, non-forest, etc.

**3. Understory / Fuels Treatments - UB** - underburn, **BB** - broadcast burn, **SB** - Slashbuster, **HP** - hand piling of slash and subsequent burning of piles, **SL** - thinning / slashing of understory vegetation, **GR** – Girdling of trees up to 8"DBH.

**Treatment Descriptions - Non-Harvest Treatments**

Jeffrey Pine Restoration - Prescribed burning, usually broadcast burning. Certain habitats may include understory thinning or slashing of certain species up to 8"DBH and hand pile and burn.

POC (Port Orford Cedar) treatment - Includes treatments to prevent the spread of the pathogen *Phytophthora lateralis (Pl)* Port Orford cedar would be removed from along roads and from infested sites to slow down the spread of the pathogen into uninfected POC areas.

Riparian Restoration - Includes understory thinning of shrubs, hardwoods, and conifers up to 6"DBH, hand pile and burn. Certain areas may include planting or seeding of riparian vegetation, placement of large logs or other woody debris into the stream channel, and/or stream stabilization measures.

White Oak restoration - Includes understory thinning of small oaks and/or slashing of invading conifers up to 8" DBH hand pile and burn and/or underburning.

Young Stand Management - Includes treatments such as tree planting, brushing, precommercial thinning, pruning, understory thinning which thins shrubs, hardwoods and conifers up to 8"DBH (diameter breast height), hand piling and burning and/or underburning.

Wildlife Habitat Restoration – Restoration of plant communities to their natural range of conditions.

Fuel Hazard Reduction – Treatment of hazardous fuels using appropriate tools to reduce the threat of wildfire to communities and forest resources.

**Logging systems** - T-Tractor, He-Helicopter, C-Cable

# Table B-2: Summary Description of the Proposed Action -Alternative 3

| | | | | | | | | | | | | Estimated Harvest Volumes (MBF) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Matrix | | Riparian | | | | | |
| T-R-S-OI# | Project Unit # | Land Alloc | TPCC | Unit Acres | Seral Stage Current | Seral Stage Post | Plant Series | Vegetation Treatment | Fuels Treatment-Understory Treatment | Logging System | Estimated Total Unit Vol | Acres | Vol/ Acre | Acres | Vol\ Acre | Total Unit | Non Harvest Treatment Acres Matrix | Non Harvest Treatment Acres Riparian | Comments |
| 40-8-9-001 | 9-1 | Matrix/ Riparian | RTR | 14 | Mature | Mature | TO | CT/MGS | UT / UB / HP / SB | T | 972 | 9 | 10 | | | 90 | | | |
| 40-8-9-002 | 9-2 | Matrix/ Riparian | NW | 36 | Mature | Mature | DF | None | None | | | | | | | | | | |
| 40-8-9-003 | 9-3 | Matrix/ Riparian | RTR | 68 | Early/ Mature | Early/ Mature | TO/DF /WO | CT/MGS | UT / HP / UB | T | 1360 | 43 | 6 | | | 258 | | | |
| 40-8-9-004 | 9-4 | Matrix/ Riparian | RTR | 28 | Early | Early | TO | Young Stand Mgt | SL / HP / SB | | | | | | | | 25 | 0 | |
| 40-8-9-005 | 9-5 | Matrix/ Riparian | RTR | 42 | Early | Early | TO | Young Stand Mgt | SL / HP | | | | | | | | 34 | 0 | |
| 40-8-9-006 | 9-6 | Matrix/ Riparian | RTR | 6 | Mature | Mature | DF | None | None | | | | | | | | | | |
| 40-8-9-007 | 9-7 | Matrix/ Riparian | RMR | 37 | Early | Early | TO | Young Stand Mgt | SL / HP | | | | | | | | 32 | 0 | |
| 40-8-9-009 | 9-9 | Matrix/ Riparian | RTR | 11 | Mature | Mature | DF | None | None | | | | | | | | | | |
| 40-8-9-010 | 9-10 | Matrix/ Riparian | RTR | 44 | Mature | Mature | TO | Fuel Haz Reduction | SL / HP / UB / SB | | | | | | | | | | |
| 40-8-9-011 | 9-11 | Matrix/ Riparian | RTR | 14 | Mature | Mature | TO | None | None | | | | | | | | | | |
| 40-8-9-012 | 9-12 | Matrix | RTR | 32 | Mature | Mature | DF | None | None | | | | | | | | | | |
| 40-8-9-013 | 9-13 | Matrix/ Riparian | RTR | 13 | Mature | Mature | DF | None | None | | | | | | | | | | |
| 40-8-20-001 | 20-1 | Matrix/ Riparian | RTR | 41 | Mature | Mature | DF | CT/MGS | UT / HP / UB | T/H | 1258 | 36 | 8 | | | 288 | | | |
| 40-8-20-002 | 20-2 | Matrix | LSW | 18 | | | NF | None | None | | | | | | | | | | |
| 40-8-21-001 | 21-1 | Matrix/ Riparian | RTR | 33 | Mature | Mature | DF | None | None | | | | | | | | | | |
| 40-8-21-002 | 21-2 | Matrix/ Riparian | LSW | 55 | | | JP/ WO | Wildlife Hab Rest | SL / UB | | | | | | | | 42 | 0 | |
| 40-8-21-003 | 21-3 | Matrix/ Riparian | RTR | 83 | Mature | Mature | TO | CT/MGS | UT / UB | T | 2905 | 75 | 10 | | | 750 | | | |
| 40-8-21-004 | 21-4 | Matrix/ Riparian | LSW | 7 | | | WO | None | None | | | | | | | | | | |
| 40-8-27-005 | 27-5 | Matrix/ Riparian | RTW | 1 | Mature | Mature | DF | None | None | | | | | | | | | | |

## *Table B-2: Summary Description of the Proposed Action -Alternative 3(cont'd)*

| | | | | | | | | | | | ------- Estimated Harvest Volumes (MBF)---------- | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | Matrix | Riparian | | | | | |
| T-R-S-OI# | Project Unit # | Land Alloc | TPCC | Unit Acres | Seral Stage Current | Seral Stage Post | Plant Series | Vegetation Treatment | Fuels Treatment-Understory Treatment | Logging System | Estimated Total Unit Vol | Acres | Vol/ Acre | Acres | Vol\ Acre | Total Unit | Non Harvest Treatment Acres Matrix | Non Harvest Treatment Acres Riparian | Comments |
| 40-8-27-006 | 27-6 | Matrix | RTR | 2 | Mature | Mature | DF | CT/MGS | UT / HP / UB | T/C | 100 | 2 | 10 | | | 20 | | | |
| 40-8-28-001 | 28-1 | Matrix/ Riparian | LSW | 208 | | | JP/ WO | Wildlife Hab Rest | SL / HP / UB / SB | | | | | | | | 171 | 0 | |
| 40-8-28-002 | 28-2 | Matrix/ Riparian | RTR/ RMR | 11 | Mature | Mature | TO | CT/MGS | SL / HP / UB / SB | T | 210 | 11 | 10 | | | 110 | | | |
| 40-8-28-003 | 28-3 | Matrix | NR | 23 | | | JP | None | None | | | | | | | | | | |
| 40-8-28-004 | 28-4A | Matrix | RTR | 9 | Mid/ Mature | Mid/ Mature | DF/TO | None | None | | | | | | | | | | Waldo and Chinese Cemeteries |
| 40-8-28-004 | 28-4B | Matrix | RTR | 10 | Mid/ Mature | Mid/ Mature | DF/TO | CT/MGS | UT / HP / UB / SB | T | 300 | 10 | 7 | | | 70 | | | |
| 40-8-28-005 | 28-5 | Matrix/ Riparian | NR | 29 | | | JP | Wildlife Hab Rest | SL / HP / UB / SB | | | | | | | | 13 | 0 | |
| 40-8-28-006 | 28-6 | Matrix/ Riparian | RMR | 44 | Mid/ Mature | Mid/ Mature | TO | CT/MGS | UT / HP / UB / SB | T | 1334 | 38 | 7 | | | 266 | | | |
| 40-8-28-007 | 28-7 | Matrix | RMR/ RTR | 21 | Mature | Mature | DF | CT/MGS | UT / HP / UB / SB | T/C/H | 1150 | 21 | 10 | | | 210 | | | |
| 40-8-32-001 | 32-1 | Matrix/ Riparian | RTR/ RMR | 35 | Mature | Mature | TO | CT/MGS | UT / HP / UB / LS | T/C/H | 825 | 32 | 8 | | | 256 | | | |
| 40-8-32-002 | 32-2 | Matrix/ Riparian | LSW | 6 | | | G/S | None | None | | | | | | | | | | |
| 40-8-33-001 | 33-1 | Matrix/ Riparian | RTR | 19 | Mature | Mature | DF | CT/MGS | UT / HP / UB | T/C/H | 208 | 17 | 6 | | | 102 | | | |
| 40-8-33-002 | 33-2A | Matrix | LSW | 33 | | | JP | Wildlife Hab Rest | BB / SB | | | | | | | | 33 | 0 | |
| 40-8-33-002 | 33-2B | Matrix/ Riparian | LSW | 234 | | | JP | Wildlife Hab Rest | BB / SB | | | | | | | | 194 | 0 | |
| 40-8-33-003 | 33-3 | Matrix/ Riparian | RMR | 15 | Mid/ Mature | Mid/ Mature | TO | None | None | | | | | | | | | | |
| 40-8-33-004 | 33-4 | Matrix | RMR | 7 | | | TO/DF | None | None | | | | | | | | | | |
| 40-8-33-007 | 33-7C | Matrix | RMR | 4 | | | JP | Wildlife Hab Rest | BB / SB | | | | | | | | 4 | 0 | |
| 41-9-2-001 | 2-1 | Matrix/ Riparian | RMR | 10 | Mature | Mature | DF/TO | None | None | | | | | | | | | | |
| 41-9-2-002 | 2-2 | Matrix/ Riparian | RTR | 23 | Early/ Mid | Early/ Mid | DF | None | None | | | | | | | | | | |

## *Table B-2: Summary Description of the Proposed Action -Alternative 3(cont'd)*

| T-R-S-OI# | Project Unit # | Land Alloc | TPCC | Unit Acres | Seral Stage Current | Seral Stage Post | Plant Series | Vegetation Treatment | Fuels Treatment-Understory Treatment | Logging System | Estimated Total Unit Vol | Estimated Harvest Volumes (MBF) Matrix Acres | Matrix Vol/ Acre | Riparian Acres | Riparian Vol\ Acre | Total Unit | Non Harvest Treatment Acres Matrix | Non Harvest Treatment Acres Riparian | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41-9-2-003 | 2-3 | Matrix/ Riparian | RTR | 26 | Mid/ Mature | Mid/ Mature | DF/TO | None | None | | | | | | | | | | |
| 41-9-2-004 | 2-4 | Matrix | RTW | 20 | | | G/S | None | None | | | | | | | | | | |
| 41-9-3-001 | 3-1A | Matrix/ Riparian | LSW | 157 | | | JP | Wildlife Hab Rest | SL / HP / UB | | | | | | | | 67 | 0 | POC Roadside Sanitation |
| 41-9-3-001 | 3-1B | Matrix/ Riparian | LSW | 23 | | | JP | Wildlife Hab Rest | SL / UB / HP | | | | | | | | 15 | 8 | POC Roadside Sanitation |
| 41-9-3-002 | 3-2 | Matrix | RTR | 18 | | | TO/DF | None | None | | | | | | | | | | |
| 41-9-9-001 | 9-1A | Matrix/ Riparian | LSW | 22 | | | JP | None | None | | | | | | | | | | POC Roadside Sanitation\Potential RNA |
| 41-9-9-001 | 9-1B | Matrix/ Riparian | LSW | 609 | | | JP | None | None | | | | | | | | | | POC Roadside Sanitation\Potential RNA |
| 41-9-10-001 | 10-1 | Matrix/ Riparian | RMR/ RTR | 31 | Mature | Mature | TO | Fuel Haz Reduction | SL / HP | | | | | | | | 25 | 0 | |
| 41-9-10-002 | 10-2 | Matrix/ Riparian | RTW | 7 | | | TO/DF | None | None | | | | | | | | | | |
| 41-9-10-003 | 10-3A | Matrix/ Riparian | RTR/ RMR | 68 | Early/ Mid | Early/ Mid | TO | Fuel Haz Reduction | SL / HP / UB | | | | | | | | 31 | 0 | |
| 41-9-10-003 | 10-3B | Matrix/ Riparian | RMR/ RTR | 68 | Early/ Mature | Early/ Mature | TO | CT/MGS | UT / UB / HP | T/H | 1168 | 48 | 5 | | | 240 | | | |
| 41-9-10-004 | 10-4A | Matrix/ Riparian | LSW | 61 | | | JP | Wildlife Hab Rest | SL / UB / HP | | | | | | | | 58 | 0 | |
| 41-9-10-004 | 10-4B | Matrix/ Riparian | LSW | 79 | | | JP | None | None | | | | | | | | | | |
| 41-9-10-005 | 10-5 | Matrix | FNR | 23 | | | JP | None | None | | | | | | | | | | |
| 41-9-10-006 | 10-6 | Matrix | RTR | 10 | Early/ Mid | Early/ Mid | DF | Fuel Haz Reduction | SL / HP / LS | | | | | | | | 10 | 0 | |
| 41-9-12-001 | 12-1 | Matrix/ Riparian | RMR/ RTR | 40 | Mature | Mature | TO | CT/MGS | UT / HP / UB | T/C/H | 1000 | 38 | 8 | | | 304 | | | |
| 41-9-13-001 | 13-1 | Matrix/ Riparian | RMR/ RTR | 40 | Mature | Mature | TO | CT/MGS | UT / HP / UB | T/C/H | 792 | 38 | 7 | | | 266 | | | |
| 41-9-14-001 | 14-1A | Matrix/ Riparian | RTR | 11 | Early/ Mid | Early/ Mid | TO | Fuel Haz Reduction | SL / UB / HP | | | | | | | | 10 | 0 | |
| 41-9-14-001 | 14-1B | Matrix/ Riparian | RTR | 28 | Mature | Mature | TO | CT/MGS | UT / HP / UB / GR | H | 200 | 24 | 3 | | | 72 | | | |

## *Table B-2: Summary Description of the Proposed Action -Alternative 3(cont'd)*

| T-R-S-OI# | Project Unit # | Land Alloc | TPCC | Unit Acres | Seral Stage Current | Seral Stage Post | Plant Series | Vegetation Treatment | Fuels Treatment-Understory Treatment | Logging System | Estimated Harvest Volumes (MBF) Total Unit Vol | Matrix Acres | Matrix Vol/ Acre | Riparian Acres | Riparian Vol\ Acre | Total Unit | Non Harvest Treatment Acres Matrix | Non Harvest Treatment Acres Riparian | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41-9-15-001 | 15-1 | Matrix/ Riparian | RMR | 30 | | | TO/DF | None | None | | | | | | | | | | |
| 41-9-15-002 | 15-2 | Matrix/ Riparian | LSW | 35 | | | JP | None | None | | | | | | | | | | |
| 41-9-15-003 | 15-3 | Matrix/ Riparian | RTW | 76 | | | TO/DF | None | None | | | | | | | | | | |
| 41-9-15-004 | 15-4 | Matrix/ Riparian | FNR/ RTR | 48 | Early | Early | DF | None | None | | | | | | | | | | |
| 41-9-15-005 | 15-5 | Matrix/ Riparian | FNR/ RTR | 17 | | | TO/DF | None | None | | | | | | | | | | |
| 41-9-15-006 | 15-6 | Matrix | FNR/ RTR | 2 | | | JP | None | None | | | | | | | | | | |
| ***Grand Total*** | | | | ***2875*** | | | | | | | ***13782*** | ***442*** | | | | ***3302*** | | | |

***Footnotes:***

**Project Unit #, OI#,** Project unit number corresponds to BLM operations inventory number that represents an inventoried area of land / vegetation.

**TPCC** (Timber Productivity Capability Classification): RTR - regeneration restricted due to hot temperatures and low soil moisture; RMR- regeneration restricted due to low soil moisture. FNR-fragile nutrient restricted; LSW- low site withdrawn; RMW-restricted moisture withdrawn

**Stand Seral Stage:** **Early** - Vegetation is dominated by shrubs or conifers and hardwood trees in a seedling/ sapling size class (<5"DBH)

**Mid** - Vegetation is tree dominated. Trees at least small pole size (>4"DBH). Larger scattered trees may be present.

**Mature** - Forest has begun to differentiate into distinct canopy layers. Overstory dominant and codominant trees are conifers greater than 20" DBH; understory trees will be conifer-hardwood mix.

**Plant Community** - TO (Tanoak), DF (Douglas-fir), JP (Jeffery Pine), WO (White oak)

**Treatment Descriptions - Harvest Treatments**

**1. Silvicultural Prescription** CT - Commercial Thin (removal of commercial conifers from an even aged stand or patch to encourage growth of remaining trees), Mod GS – Modified Group Selection (harvest where a vigorous sugar or Ponderosa pine or non-tanoak hardwood is left and surrounding commercial and non-commercial conifers are removed), SR - Structural Retention (regeneration timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished), and SC - Stand Conversion (A process in which vegetation that currently dominates a site is removed and is replaced with a species that better meets timber management objectives).

**2. Harvest Acres** - These are gross acres and do not include buffers for plants, animals, etc. **Harvest acres vs. Unit acres:** The difference in these acreages is attributable to large variability within the unit, unit inclusions of riparian reserves, non-forest, etc.

**3. Understory / Fuels Treatments - UB** - underburn, **BB** - broadcast burn, **SB** - Slashbuster, **HP** - hand piling of slash and subsequent burning of piles, **SL** - thinning / slashing of understory vegetation, **GR** – Girdling of trees up to 8"DBH.

**Treatment Descriptions - Non-Harvest Treatments**

Jeffrey Pine Restoration - Prescribed burning, usually broadcast burning. Certain habitats may include understory thinning or slashing of certain species up to 8"DBH and hand pile and burn.

POC (Port Orford Cedar) treatment - Includes treatments to prevent the spread of the pathogen *Phytophthora lateralis (Pl)* Port Orford cedar would be removed from along roads and from infested sites to slow down the spread of the pathogen into uninfected POC areas.

Riparian Restoration - Includes understory thinning of shrubs, hardwoods, and conifers up to 6"DBH, hand pile and burn. Certain areas may include planting or seeding of riparian vegetation, placement of large logs or other woody debris into the stream channel, and/or stream stabilization measures.

White Oak restoration - Includes understory thinning of small oaks and/or slashing of invading conifers up to 8"DBH, hand pile and burn and/or underburning.

Young Stand Management - Includes treatments such as tree planting, brushing, precommercial thinning, pruning, understory thinning which thins shrubs, hardwoods and conifers up to 8"DBH (diameter breast height), hand piling and burning and/or underburning.

Wildlife Habitat Restoration – Restoration of plant communities to their natural range of conditions.

Fuel Hazard Reduction – Treatment of hazardous fuels using appropriate tools to reduce the threat of wildfire to communities and forest resources.

| |
|---|
| Logging systems - T-Tractor, He-Helicopter, C-Cable |

# APPENDIX C: ROADS PROPOSED ACTIONS

**Table C-1: Proposed Road Use, Construction, Renovation, Improvement, Maintenance**

| Road Number/ Road Seg. | Road Control | Total Length (miles) | Current Condition/ Surface type | Miles of Proposed Treatment: | | | COMMENTS |
|---|---|---|---|---|---|---|---|
| | | | | Maintenance | Construc. | Renovation | |
| FS 4402 | USFS | 4.5 | ASC | 4.5 | | | USFS road, maintain in existing condition |
| FS 4803 | USFS | 1.70 | ASC | 1.70 | | | USFS road, maintain in existing condition |
| 40-8-4A | BLM | 1.23 | GRR | 1.23 | | | Blade, repair drainage, brush, spot rock as needed |
| 40-8-4B | BLM | 1.40 | NAT | 1.40 | | | Blade, repair drainage, brush, spot rock as needed |
| 40-8-9 | BLM | 0.4 | NAT | 0.4 | | 0.4 | Blade, repair drainage, brush, spot rock as needed |
| 40-8-9.1 | BLM | 0.3 | NAT | 0.3 | | 0.3 | Blade, brush, spot rock as needed |
| 40-8-21 | BLM | 0.24 | NAT | 0.24 | | 0 | Blade, repair drainage, spot rock as needed |
| 40-8-28A | BLM | 0.34 | NAT | 0.34 | | 0 | Blade, repair drainage, brush, spot rock as needed. |
| 40-8-28B | BLM | 0.7 | NAT | 0.7 | | 0 | Blade, repair drainage, brush, spot rock as needed |
| 40-8-28.1 | BLM | 0.45 | NAT | 0.45 | | 0 | Blade, repair drainage, brush, spot rock as needed |
| 40-8-28.2A | BLM | 0.20 | NAT | 0.20 | | 0.20 | Blade, repair drainage, brush, spot rock as needed |
| 40-8-28.2C | BLM | 0.75 | NAT | 0.75 | | 0.75 | Renovate, blade, repair drainage, spot rock as needed, install 4 culverts 18”x32’, install gate or block road after timber sale |
| 40-8-28.2D | Private | 0.65 | NAT | 0.65 | | 0.65 | Renovate, blade, repair drainage, spot rock as needed |
| 40-8-28.3A | BLM | 0.1 | NAT | 0.1 | | 0.1 | Renovate, blade, repair drainage, spot rock as needed |
| 40-8-28.3B | Private | 0.25 | NAT | 0.25 | | 0.25 | Renovate, blade, repair drainage, spot rock as needed. Requires road easement across private land |
| 40-8-28.3C | BLM | 0.20 | NAT | 0.20 | | 0.20 | Renovate, blade, repair drainage, spot rock as needed |
| 40-8-33 | BLM | 0.2 | NAT | 0.2 | | 0.2 | Reconstruct road, outslope, brush, install drainage dips and culverts, spot rock as needed |
| 40-8-27A | BLM | 0.2 | NAT | 0.2 | | 0 | Blade, repair drainage, brush, spot rock as needed |
| 41-9-2 | Private | 0.20 | NAT | 0.20 | | 0 | Blade, repair drainage, brush, spot rock as needed |
| 41-9-14.1 | Private | 3.10 | NAT | 3.10 | | 0 | Blade, repair drainage, brush, spot rock as needed |
| 41-9-14 | Private | 0.50 | NAT | 0.50 | | 0 | Blade, repair drainage, brush, spot rock as needed |
| 41-9-13 | Private | 1.9 | NAT | 1.9 | | 0 | Blade, repair drainage, brush, spot rock as needed |
| 41-9-9A | BLM | 0.40 | NAT | 0.4 | | 0.4 | Install gate, replace log culvert and surface over crossings. |
| 41-9-12B | BLM | 0.35 | NAT | | 0.35 | 0 | New road |
| 41-9-12A | Private | 0.10 | NAT | | 0.10 | 0 | New road on private land |
| 41-9-12.1 | BLM | 0.10 | NAT | | 0.10 | 0 | New road |
| 41-9-13.1B | BLM | 0.35 | NAT | | 0.35 | 0 | New road |
| 41-9-13.1A | Private | 0.10 | NAT | | 0.1 | 0 | New road on private land |
| Sec 41-9-12 Op. Spurs | BLM | 0.13 | NAT | | 0.13 | 0 | New operator spur; decommission following use. |
| Sec 41-9-13 Op. Spur | BLM | 0.20 | NAT | | 0.20 | 0 | New operator spur; decommission following use. |
| Sec 40-8-28 Op. Spur | BLM | 0.44 | NAT | | 0.1 | 0.43 | Reconstruct existing spur; barricade following use. |
| | | | | 19.91 | 1.43 | 3.88 | |

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